

MINERAL APPRAISAL OF THE CORONADO NATIONAL FOREST
PART 1, PINALENO-GREASEWOOD MOUNTAINS UNIT,
GRAHAM COUNTY, ARIZONA

by
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BRUCE BABBITT, Secretary

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PREFACE

A January 1987 Interagency Agreement between the Bureau of Mines, U.S. Geological Survey, and U.S. Forest Service describes the purpose, authority, and program operation for the forest-wide studies. The program is intended to assist the Forest Service in incorporating mineral resource data in forest plans as specified by the National Forest Management Act (1976) and Title 36, Chapter 2, Part 219, Code of Federal Regulations, and to augment the Bureau's mineral resource data base so that it can analyze and make available minerals information as required by the National Materials and Minerals Policy, Research and Development Act (1980).

This open-file report summarizes the results of a Bureau of Mines forest-wide study. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. This study was conducted by personnel from the Resource Evaluation Branch, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

cps	counts per second
\$	dollar (U.S.)
ft	foot
in.	inch
lb	pound
mi	mile
%	percent
oz	troy ounce
oz/st	troy ounce per short ton
ppb	part per billion
ppm	part per million
st	short ton (2,000 lb)
stu	short ton unit (20 lb)

MINERAL APPRAISAL OF THE CORONADO NATIONAL FOREST, PART 1,
PINALENO-GREASEWOOD MOUNTAINS UNIT, GRAHAM COUNTY, ARIZONA

By S. Don Brown¹

SUMMARY

Between 1990 and 1992, the Bureau of Mines conducted a mineral investigation of the Pinaleno-Greasewood Mountains part of the Coronado National Forest to appraise the mineral resources and to identify and describe areas with past mining activity. The study included a comprehensive literature search combined with a field investigation involving the examination of known mines, prospects, and mineralized areas. This study is part of the Bureau's overall mineral evaluation of the Coronado National Forest and will be included in a summary report of the Forest.

The Pinaleno Mountains have few mineral occurrences and mines and prospects are few and scattered. The only clear record of mineral production is from the Black Beauty prospect, where 240 lbs of tungsten oxide was produced in 1955. No mineral resources were identified during this study; only occurrences of precious and base metals, and tungsten. There is no known current mining activity in this part of the Forest.

INTRODUCTION

During 1990-1992, the Bureau of mines studied the mineral resources of the Pinaleno-Greasewood Mountains, on land administered by the U.S. Forest Service.

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This study is part of the Bureau's overall mineral evaluation of 13 study units of the Coronado National Forest.

Geographic setting

The Pinaleno-Greasewood Mountains include 198,411 acres (310 mi²) of the Coronado National Forest, in Graham County, southeastern Arizona (fig. 1). The southern part of the range is generally referred to as the Greasewood Mountains. Pima, Thatcher, and Safford are major communities north-northeast of the range, and Willcox is a major community south of the range. Sulphur Springs Valley borders the Pinaleno Mountains on the west and southwest, and San Simon Valley borders the range on the east side. Elevations in the Forest range from 3,440 ft on the east side to 10,720 ft on Mount Graham. Interstate Highway 10 is south of the Forest. U.S. Highway 666 parallels the Forest on the east from which State Highway 366 provides access to the central part of the range, and State Highway 266 crosses through the range to the west. U.S. Highway 70 is northeast of the Forest, an unnamed all weather road is north of the Forest, and the Aravaipi Road is on the west side of the Forest. From these highways and roads, numerous Forest trails and unimproved dirt roads provide access to the Forest.

Previous investigations

The most comprehensive report on the geology of the Pinaleno Mountains was by Thorman (1981). The geology of the southern part of the range was mapped by Cooper (1960). Bergquist (1979) compiled a geologic map of the Blue Jay Peak Quadrangle, which includes a northwestern part of the Forest. Swan (1976) discussed a major structural feature in the Forest, the Stockton Pass fault (plate 1). A number of unpublished field engineers' reports that evaluate unpatented mining claims and

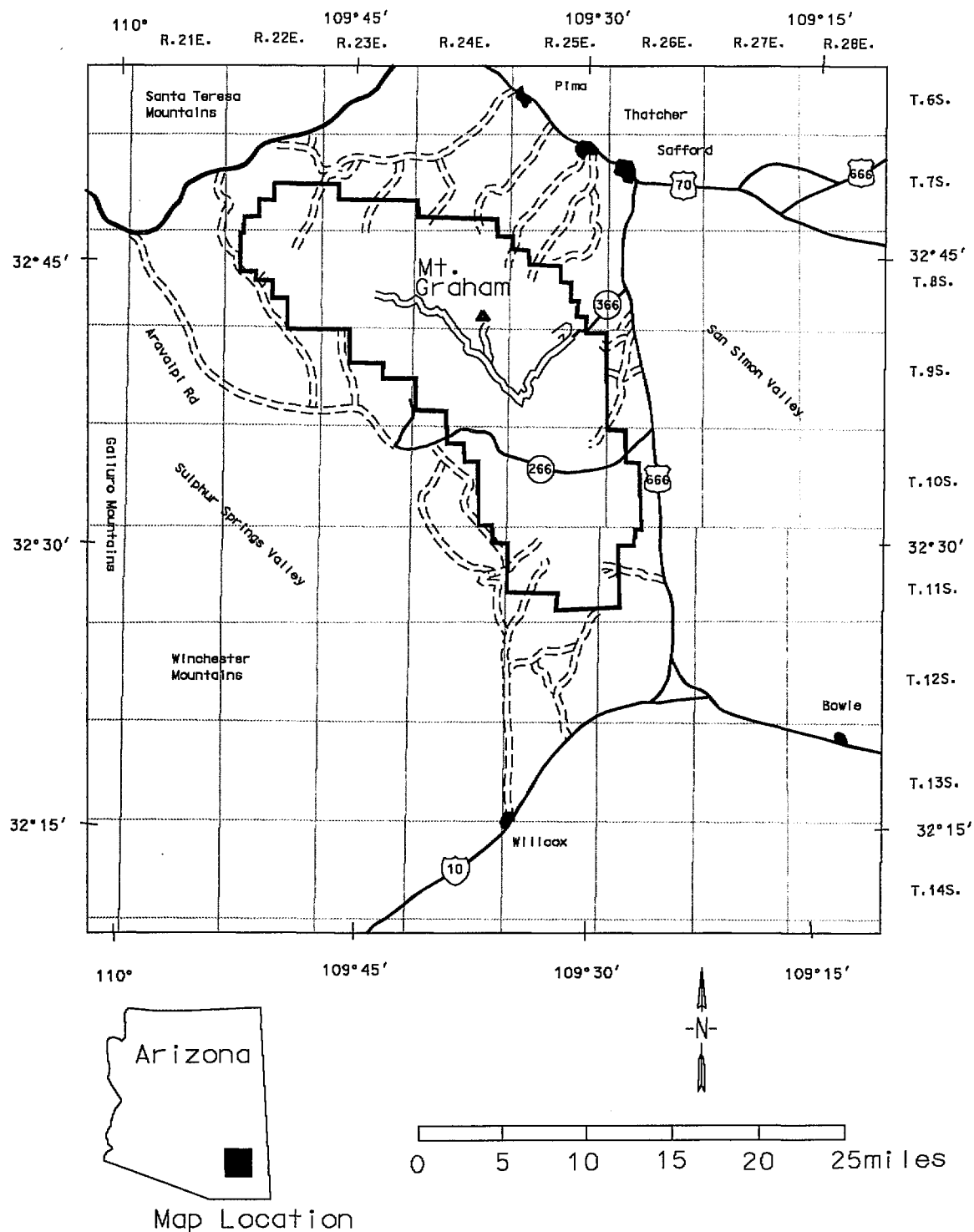


Figure 1.-- Index map of the Pinaleno-Greasewood Mountains Unit
 Coronado National Forest,
 Graham County, Arizona

prospects are on file with the Arizona State Department of Mines and Mineral Resources in Phoenix, and at the Anaconda Geological Document Collection at the University of Wyoming in Laramie, Wyoming.

Methods of investigation

A detailed literature search for pertinent geologic and mining information for the Forest was made prior to the field investigation. Bureau of Land Management and county records were examined for patented and unpatented mining claim locations.

The Bureau's field study concentrated on the examination of known mines, prospects, and mineralized areas inside the Forest boundary. A total of 20 field-days was spent during the spring of 1990 and the winter of 1991. Accessible mine and prospect workings were mapped and sampled. Veins, potentially mineralized structures, altered and/or mineralized outcrops, and dumps of inaccessible workings were sampled.

Seventy-six samples were taken; they consisted of four types: 1) chip - a regular series of rock chips taken in a continuous line across a mineralized zone or rock face; 2) grab - rock collected randomly from a dump, stockpile, other rock at a mine working, or float; 3) select - sample intentionally selected from mineralized rock resulting in maximum mineral concentrations; 4) dump - rock collected from a mine dump on a grid or spaced such that a representative sample of the dump is taken. All samples were analyzed by Chemex Labs, Inc. of Vancouver, British Columbia for 32 elements by an inductively coupled plasma (ICP) method, and by Bondar-Clegg, Inc. of Vancouver, British Columbia for 34 elements by a neutron activation method. Selected samples were re-analyzed by Chemex for specific elements when the assay values were above the saturation limits for instrumental analysis; these elements

include barium, copper, lead, silver, and zinc. Sample descriptions are summarized in appendix A, and all the analytical results are in appendixes B and C. Where sample analytical data is presented in this report, the higher of the two values, either Chemex and Bondar-Clegg, is shown.

Geologic setting

The Pinaleno Mountains are a north- to northwest-trending mountain range in the Mexican Highland section of the Basin and Range physiographic province. They constitute one of the highest and most rugged ranges in southeastern Arizona. Most of the bedrock in the range consists of Precambrian granite and granitic gneiss. Tertiary volcanic units are common in the southern part of the range, along with a Tertiary granitic stock. A major structural feature in the range is the Stockton Pass fault zone, a four-mile-wide left-lateral fault system trending west-northwest through the area of Stockton Pass (plate 1).

Mining history

The Pinaleno Mountains have few mineral occurrences and mines and prospects are few and scattered. The only clear record of production is for the Black Beauty prospect where 4.5 st of ore yielded 12 stu (240 lb) of tungsten oxide (WO_3) in 1955. The claim was originally located in 1916 for gold (Dale, 1959, p. 65). Unpublished field engineers' reports on file with the Arizona State Department of Mines and Mineral Resources discuss prospecting activity at the Stony Peak and White Rock uranium prospects in the mid and late 1950's, and rotary drilling in 1959 near Willow Springs Canyon to test for base and precious metals. During the present investigation, no evidence of recent mining activity in the Forest was found.

MINERAL APPRAISAL

Lindsey Canyon area

A number of mines and prospects are in the Lindsey Canyon area in and near the northwest part of the Forest (plate 1, fig. 2). Sample PI 1 is from a quartz stockpile at an adit driven about 250 ft on an of aphanitic, dark gray dike and a quartz vein. The adit was not mapped or sampled because of loose rock conditions. The assay showed low metal concentrations in the quartz sample; pyrite is the only metallic mineral identified. Sample PI 2 is from a quartz vein in a prospect pit in granite. A minor amount of pyrite is in the quartz, and the assay showed low concentrations of metals (appendix B, C). Sample PI 3 is from a quartz stockpile alongside a prospect pit. Azurite, galena, and malachite are in the quartz, and the sample contained 0.772 oz/st gold, 17.9 oz/st silver, 1.3% copper, and 1.9% lead. The quartz vein could not be seen in place due to sloughing and does not have continuity at the surface. Sample PI 4 is from a quartz stockpile alongside a small prospect pit that crops out intermittently for about 100 ft at the surface. The quartz contains blebs of galena and pyrite, and the sample assayed 6.6 oz/st silver, 583 ppm copper, and 1.4% lead. Sample PI 5 is from a quartz vein containing minor pyrite, galena, and malachite stains in a pit in granitic rock. The sample contained low metal concentrations. The quartz vein crops out intermittently for about 400 ft along strike.

The President Mine is about 1/2 mi southeast of Lindsey Canyon (fig. 2). The main working is a shaft sunk on a 5- to 6-ft-thick quartz vein adjacent to prominent shearing in granite. Continuity of the quartz vein is not evident at the surface. A select sample (PI 7) from a quartz stockpile with disseminated pyrite and pyrite stringers assayed 1.32 oz/st gold and 9.0 oz/st silver. A random grab of the quartz

stockpile (PI 8) had low metal concentrations, 2 ppm gold and 8 ppm silver. Sample PI 6 is a chip sample from a 2-ft-thick quartz vein in a nearby prospect pit. This sample also contained low metal concentrations. No resources could be identified in the Lindsey Canyon area because of limited and discontinuous exposures of mineralized rock.

Swan and Chakarun (1973) identify a favorable porphyry-type copper deposit target area in the Lindsey Canyon area, about 1 mi southwest of the Forest. The target area is at or near a contact between Tertiary volcanic rock and Precambrian granite, at a depth of 500-2,000 ft. The supposition of a mineralized area is based upon favorable geologic conditions at the intersection of a prominent west-northwest-trending basement thrust fault and a northeast-trending dike swarm. According to that report, the base-metal-sulfide veining associated with the dikes, and persistent copper-oxide mineralization related to the thrust fault suggest remobilization of copper from a source area southwest of the Forest. The rock type at the Forest boundary and in the Forest is Precambrian granite and is about 1 mi distant from the contact with Tertiary volcanic rocks. The target area, therefore, probably does not extend into the Forest because of the change in rock type and geologic environment.

Numerous prospects are present outside the Forest in the Lindsey Canyon area, but were not examined during this investigation because they are located on private land.

Northeast of Lindsey Canyon, near Bellows Canyon, an 80-ft-long adit exposes a highly fractured quartz vein in altered granite (plate 1, fig. 3). Five samples from this adit have low metal concentrations (PI 9-13, Appendixes B, C) and no ore minerals were recognized.

Black Beauty prospect

The Black Beauty tungsten prospect is just inside the Forest boundary, between Van Valer Canyon and Durkee Canyon (plate 1, fig. 4). The major working is an open cut about 50 x 15 x 15 ft deep at the face, from which 12 short ton units (240 lb) of WO_3 was produced from 4.5 st of ore in 1955 (Dale, 1959, p. 65). The cut exposes a discontinuous quartz vein as much as 3 ft thick in Precambrian schist. An inspection for the presence of scheelite with a black light revealed sparse disseminated scheelite in the schist and none in the quartz. A sample of the schist (PI 14) assayed 27 ppm tungsten; tungsten was not detected in a sample of the quartz (PI 15, appendix B). Apparently a small, high-grade zone of scheelite was mined out in the open cut. A number of quartz outcrops are exposed on the hill above the Black Beauty prospect. Trace amounts of tungsten were detected in the five samples taken from the quartz outcrops (samples PI 16-20, fig. 4).

Gold Gulch prospects

A number of small adits, shafts, and pits are in and near Gold Gulch, about 2 mi east of Fort Grant (plate 1, figs. 5-8). The workings apparently are gold prospects; gold was detected in 13 of 18 samples taken from the prospects (samples PI 21-38, appendix C), with the highest gold assay being 2200 ppb (0.064 oz/st). Most of the workings were dug on narrow fault zones and shears, some with thin quartz veins and stringers, in Precambrian granite and altered granite. The faults and shears are likely related to the northwest-trending Stockton Pass fault zone (plate 1). Pyrite was the only ore mineral identified in this area, and all the samples have low metal concentrations. No resources could be identified in the Gold Gulch area because of

low metal concentrations and the small size of the structures. The individual workings are summarized in appendix D.

Prospects in the southern Pinaleno Mountains

There are a number of small prospects in the southern part of the Pinaleno Mountains, south of State Highway 266. Near Mothers Canyon is an 11-ft deep shaft on a contact between granite and a mafic dike. A small amount of the granite contains disseminated chalcopyrite (mostly in quartz veinlets), and abundant malachite stains. Two samples (PI 39, 40) taken at this working assayed 1,118 and 6,071 ppm copper, with low concentrations for other metals (appendix B, plate 1).

The Stony Peak and White Rock uranium prospects are near Cove Canyon (plate 1, samples 41-43). At the Stony Peak prospect is a small, open-cut in Precambrian granite. Scintillometer readings in the cut were up to six times the background of about 160 cps. Sample PI 42 from the cut assayed 46 ppm uranium and 46 ppm thorium and sample PI 43 from the dump assayed 54 ppm uranium and 47 ppm thorium (appendix B). At the White Rock prospect is a shallow, sloughed pit in Precambrian granite. Scintillometer readings in the pit are about twice the background of 80 cps. Sample PI 41 from a small dump assayed 30 ppm uranium and 39 ppm thorium. No uranium minerals or resources were identified at either prospect.

Near O-Bar-O Canyon (plate 1, samples PI 45, 46) a 15-ft-deep shaft exposes a shear zone at least 5 ft thick between a contact of fine-grained dacite and dacite porphyry. This is likely a turquoise prospect because a 3/8 in. thick seam of turquoise is exposed in the shaft, and pieces of turquoise are on the dump. Sample PI 45 from the shear zone had a copper concentration of 1,932 ppm, and a select sample (PI 46) from the dump assayed 3.92% copper and 47 ppm silver. Both samples had low

concentrations of other metals, and no resources were identified at this shaft. About 2,000 ft northwest of this shaft is an altered area near a contact between granitic and volcanic rock. A grab sample (PI 44) of the altered rock had negligible metal values.

Near Gillman Canyon (plate 1, sample PI 47) is a 31-ft-deep shaft in a sheared zone in maroon andesite porphyry. Chrysocolla fills some of the fractures in the rock. A select sample from a small ore stockpile assayed 7.7% copper, 117 ppm silver, and 3,345 ppm arsenic, with low concentrations of other metals (appendix B). At the surface, the mineralized structure could not be traced beyond the shaft.

South of Willow Spring Canyon (fig. 9) several prospects were dug on mafic dikes in Precambrian granite. A select sample (PI 51) of altered rock from the dump of a 30 ft decline containing galena, smithsonite, and sphalerite assayed 6.9% lead, 17.1% zinc, 1,320 ppm cadmium, 1,016 ppm copper, and 23 ppm silver. No mineralized rock was identified in-situ in the decline, or at any of the other workings in this area, and the other samples have low metal concentrations (samples PI 48-53). The prospects are summarized in appendix D.

Near the head of Willow Springs Canyon (Plate 1, samples PI 54, 55) are several small prospects in volcanic rock. Sample PI 54 is a select sample from a small stockpile alongside a bulldozer cut. A minor amount of chrysocolla is in the stockpile; the sample assayed 2.7% copper. No structure or mineralized rock was visible in the bedrock. Near the bulldozer cut is a small pit exposing a shear zone with altered, clayey gouge and abundant limonite. No ore minerals were observed, but sample PI 55 from the shear assayed 5,734 ppm lead and 5,938 ppm zinc. The shear is not exposed beyond the pit due to ground cover. No resources were identified from surface exposures near the head of Willow Springs Canyon.

Near the head of Little Cottonwood Canyon (plate 1, sample PI 56) is a 34-ft-deep shaft in alluvium consisting of volcanic debris. On the dump is a minor amount of chrysocolla. A grab sample (PI 56) from the dump had low metal concentrations, and no resources were identified at the shaft.

Prospects in the east and northeast part of the Pinaleno Mountains

In Righthand Canyon a 100-ft-long adit with a stope to the surface and an adjoining trench expose a major fault zone in Precambrian granite. Pyrite and galena are present in the fault zone. Of four samples taken from the fault, two had 2,730 and 2,600 ppb gold, and 1,690 and 3,440 ppm lead. The metal concentrations are well below ore-grade for a vein-type deposit. All the samples (PI 57-60) have low concentrations of other metals.

North of Spring Canyon (plate 1, Samples PI 61, 62) is a trench on a major fault zone in Precambrian granite. A select sample of dump rock containing chrysocolla contained 5.1% copper (sample PI 61) and sample PI 62 from the fault zone contained 4,172 ppm copper. The samples had low concentrations of other metals.

Near Lefthand Canyon is a small cut in altered Precambrian gneiss, adjacent to a quartz outcrop about 10 ft across. No ore minerals were identified at the cut, and sample PI 63 from the altered gneiss had low metal concentrations. However, the sample assayed 564 ppm thorium and 112 ppm uranium, which is well above all the other samples taken in the Forest but below commercial grade for large-scale deposits.

In Marijilda Canyon is a small prospect along a shear zone adjacent to a silicified zone with abundant disseminated pyrite (plate 1, samples PI 64, 65). Samples from this prospect had low metal concentrations.

In the northeast part of the Forest, between Ash Creek and White Streaks Canyon, are 255-ft-long and 23-ft-long adits in mafic, granitic schist (plate 1, samples PI 66-76). The only ore mineral identified in the adits was minor amounts of malachite. The 11 samples from the adits all had low metal concentrations.

No resources were identified at any of the prospects in the east and northeast part of the Forest because of low concentrations of metals and discontinuous occurrences of ore minerals.

CONCLUSIONS

No mineral resources were identified in the Pinaleno-Greasewood Mountains Unit due to the spotty mineral occurrences and weak mineralization at and near prospects. The only known production from within the Forest is a small amount of tungsten from the Black Beauty prospect. Any production from other prospects would have been small. Based upon mineral occurrences examined, future prospecting activity would most likely occur in the Lindsay Canyon area, in the Gold Gulch area, and the area south of and near Willow Springs Canyon.

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APPENDIX A

DATA FOR SAMPLES FROM THE PINALENO-GREASEWOOD MOUNTAINS UNIT,
CORONADO NATIONAL FOREST, GRAHAM COUNTY, ARIZONA

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.
{xx, not applicable}

Sample Number	Type	Length	Remarks
PI 1	Select	xx	Adit, large dump; quartz stockpile, minor pyrite; rock on dump weathered granite and dark gray, aphanitic dike rock.
PI 2	Chip	1.5 ft	Prospect pit; quartz vein in granite, strike N. 35° W., vertical dip; minor fine disseminated pyrite, manganese stains.
PI 3	Select	xx	Prospect pit; quartz stockpile, galena, malachite, azurite, limonite; granite country rock.
PI 4	Grab	xx	Small prospect pit; quartz vein up to 2.5 ft thick, strike N. 40° W., near vertical dip; crops out intermittently on surface for approximately 100 ft; blebs of galena, minor pyrite, most pyrite oxidized.
PI 5	Chip	4 ft	Prospect pit; 4-ft-thick quartz vein in fine-grained granitic rock, strike, N. 85° W., dip 88° N.; crops out on surface intermittently for approximately 400 ft; sparse disseminated pyrite, galena, malachite.
PI 6	Chip	1.3 ft	Quartz vein in granite, on strike with and 60 ft from President Mine shaft, sample PI 7.
PI 7	Select	xx	President Mine shaft dump; medium dump ¹ ; shaft sunk on 5-ft to 6-ft-thick quartz vein adjacent to prominent shearing, strike N. 85° E., vertical dip; granitic rock outcrops on surface. Most of dump is a bluish-gray, aphanitic, rock, possibly a dike; sample of quartz stockpile with disseminated pyrite and pyrite stringers, some oxidation.
PI 8	Grab	xx	Do.

¹ Dump size was used to estimate length of a 4-ft x 6-ft working.
Small dump = 10-100-ft long adit.
Medium dump = 100-300-ft long adit.
Large dump = over 300-ft long adit. 15

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 9	Chip	5 ft	Adit, 80 ft long; highly fractured quartz vein, limonite stains, general strike N. 70° E., dip 60° NW.; country rock altered granitic rock (figure 3).
PI 10	Chip	2.5 ft	Same adit as sample PI 9; Prominent fault, up to 1-ft-thick zone of clayey gouge, minor limonite stains.
PI 11	Chip	4 ft	Do.
PI 12	Chip	4 ft	Same adit as sample PI 9; fractured quartz, abundant limonite; sheared and gougy granitic rock adjoining quartz.
PI 13	Chip	4.5 ft	Same adit as sample PI 9; major 2-ft-thick shear zone in altered granitic rock; fractured and limonite stained quartz.
PI 14	Chip	2 ft	Open cut, zone in schist with sparse disseminated scheelite.
PI 15	Chip	3 ft	Open cut, 3-ft-thick quartz vein in muscovite schist, strike N. 45° E., vertical dip; sparse disseminated scheelite; within 50 ft of contact with granite.
PI 16	Chip	4 ft	Quartz vein, as much as 12 ft thick, crops out 50 ft along strike, N. 85° E., near vertical dip, in muscovite schist.
PI 17	Chip	4 ft	Quartz vein, as much as 8 ft thick, crops out 40 ft along strike, strike N. 75° W., dip 83° N., in muscovite schist.
PI 18	Chip	2 ft	Small quartz outcrop in muscovite schist.
PI 19	Chip	6 ft	Outcrop, 6-ft-thick quartz vein in muscovite schist.
PI 20	Chip	2.5 ft	Outcrop, quartz vein as much as 3 ft thick, crops out 10 ft along strike, strike N. 85° E., dip 60° N., in muscovite schist.

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 21	Chip	1.5 ft	Prospect pit, fault, strike N. 50° W., vertical dip; granite, altered granite, limonite and manganese stains, minor pyrite and pyrite pseudomorphs.
PI 22	Chip	1.5 ft	Open cut; dike, strike N. 50° W., vertical dip; aphanitic, tan, weathered; minor limonite and manganese stains; country rock weathered granite.
PI 23	Chip	2.5 ft	Prospect pit, 10 ft deep; prominent shear zone, strike N. 45° E., dip 75° NE.; altered and sheared granite, disseminated pyrite, some oxidation.
PI 24	Chip	3 ft	Prospect pit, 10 ft deep; same shear zone as sample PI 23, altered granite, disseminated pyrite.
PI 25	Chip	3 ft	Prospect pit, 10 ft deep; same shear zone as sample PI 23, strike N. 55° E., near vertical dip; altered and sheared granite, limonite stained; prominent quartz vein 4 in. thick.
PI 26	Chip	3 ft	Prospect pit, 10 ft deep; prominent fault zone in altered and fractured granite; quartz lens 4 in. thick.
PI 27	Chip	8 ft	Portal of adit, approximately 75 ft long; prominent fault zone, altered and limonite stained granite.
PI 28	Chip	4 ft	Pit dug into adit, same adit as sample PI 27, two parallel fault zones, altered granite and a dike of black, aphanitic rock.
PI 29	Select	xx	Small prospect pit, above adit sample PI 30, same structure; sample from stockpile of quartz vein material, country rock altered and weathered granite, limonite stained.
PI 30	Chip	3 ft	Adit, at least 95 ft of workings; major fault zone in altered granite, gouge, silicified rock.

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 31	Chip	2 ft	Same adit as sample PI 30; intersection of two thin quartz veins, limonitic gouge and altered granite.
PI 32	Chip	2 ft	Same adit as sample PI 30; 8-in.-thick quartz vein; limonite stained, altered granite; minor gouge.
PI 33	Chip	3 ft	Adit, 90 ft long; prominent fault zone in altered, fine-grained granite, strike E-W, dip 60°-85° N.
PI 34	Chip	2.5 ft	Same adit as sample PI 33; altered and fractured granite, minor gouge.
PI 35	Chip	2.5 ft	Same adit as sample PI 33; altered and fractured granite, limonite stains.
PI 36	Chip	2.5 ft	Same adit as sample PI 33; fractured, medium-grained granite, minor limonite stains.
PI 37	Chip	4 ft	Prospect pit, 10 ft deep; wide shear zone in white quartzite, strike N. 75° W., vertical dip; pyrite pseudomorphs replaced with limonite.
PI 38	Select	xx	Shaft, 20 ft deep; prominent shear zone 2 to 2-1/2 ft thick, strike N. 25° E., dip 75° SE; white quartzite, disseminated pyrite pseudomorphs replaced with limonite.
PI 39	Grab	xx	Shaft, 11 ft deep; contact between granite and mafic dike; sample of dike rock.
PI 40	Select	xx	Same shaft as sample PI 39; sample of granite, abundant malachite stains, chalcopryite disseminated in quartz veinlets; granite altered near contact.
PI 41	Dump	xx	Uranium prospect pit; granite, limonite stains; adjacent to big quartz outcrop; scintillometer reading about two times background.
PI 42	Chip	5 ft	Open cut; uranium prospect; granite; shear zone, strike N. 78° W., vertical dip; scintillometer readings up to six times background.

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 43	Dump	xx	Dump; open cut, same as sample PI 42; granite.
PI 44	Grab	xx	Outcrop, altered and bleached rock, abundant limonite on or near contact between granite and volcanic rock; alteration zone about 100 ft diameter.
PI 45	Chip	4.5 ft	Shaft, 15 ft deep; shear zone, 5 ft thick, strike N. 60° E., dip 86° SE.; between two rock types: fine grained dacite and dacite porphyry; sparse copper staining, 3/8-in.-thick seam of turquoise.
PI 46	Select	xx	Same shaft as sample PI 45; sample of rock on dump with most turquoise in it.
PI 47	Select	xx	Dump, small ore stockpile; shaft, 31 ft deep; fracture zone, strike N. 75° W., vertical dip; maroon andesite porphyry, chrysocolla in fractures.
PI 48	Chip	4.5 ft	Trench; contact similar to sample PI 50, strike N. 70° E., dip 65° S.; granitic country rock about 70 ft either side of trench.
PI 49	Dump	xx	Dump of water filled shaft, 28 ft deep; dark gray to black, mafic dike rock.
PI 50	Chip	2 ft	Decline, about 30 ft long; contact, strike N. 55° W., dip 45° SW.; hanging wall: aphanitic, crumbly, chocolate-colored rock; footwall: aphanitic, bluish-purple-dark gray rock.
PI 51	Select	xx	Same working as sample PI 50; small stockpile, altered rock, disseminated galena, smithsonite, limonitic gossan material.
PI 52	Chip	6 ft	Decline, approximately 50 ft long; sheared dike and quartz stringers; country rock granite.
PI 53	Dump	xx	Prospect pit; mafic dike rock and altered granite.
PI 54	Select	xx	Bulldozer cut, small stockpile, volcanic rock, minor chrysocolla.

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 55	Chip	2 ft	Prospect pit; shear zone in volcanic breccia, strike N.-S., vertical dip; altered, weathered, clayey gouge; abundant limonite.
PI 56	Grab	xx	Dump of shaft, 34 ft deep; alluvium, volcanic debris, minor chrysocolla.
PI 57	Chip	3 ft	Adit, 100 ft long; stopes, trench; prominent fault, strike N. 38° E., vertical dip; fractured and altered granite, quartz stringers and fragments, pyrite pseudomorphs, limonite; granite country rock. (See figure 10.)
PI 58	Chip	3.5 ft	Same adit as sample PI 57; sample similar to sample PI 57, abundant pyrite, minor galena.
PI 59	Chip	1.5 ft	Same adit as sample PI 57; sample similar to sample PI 57, minor pyrite.
PI 60	Chip	3.5 ft	Trench on same fault as sample PI 57; fractured granite, intermixed quartz, clayey gouge.
PI 61	Select	xx	Dump of trench; quartz pods and lenses in fault zone; abundant chrysocolla, hematite, limonite; country rock granitic gneiss.
PI 62	Chip	4 ft	Same trench as sample PI 57; major fault zone, strike N. 35° W., near vertical dip; sheared granite gneiss, clayey gouge, limonite.
PI 63	Chip	3.5 ft	Zone of altered gneiss, adjacent to big outcrop of bull quartz; limonite; country rock granitic gneiss.
PI 64	Chip	3 ft	Tunnel, 10 ft long; siliceous zone, mostly quartz, abundant disseminated pyrite; zone about 6 ft long; country rock intermixed granitic gneiss and biotite gneiss.
PI 65	Chip	1 ft	Same working as sample PI 64; shear zone adjacent to pyritized zone, strike N.-S., dip 25° E.; sheared gneiss, clayey gouge.

Appendix A.--Data for samples from the Pinaleno-Greasewood Mountains,
Coronado National Forest.--Continued

Sample Number	Type	Length	Remarks
PI 66	Chip	7 ft	Adit, 255 ft long; mafic schist; aplite stringers up to 8 in. thick. (See figure 11.)
PI 67	Chip	3 ft	Same adit as sample PI 66; mafic schist; quartz-aplite stringers up to 10 in. thick.
PI 68	Chip	1.5 ft	Same adit as sample PI 66; mafic schist; prominent aplite vein, minor limonite stains.
PI 69	Chip	3 ft	Same adit as sample PI 66; mafic schist; 2.5-in. aplite vein, minor malachite and limonite stains.
PI 70	Chip	2.5 ft	Same adit as sample PI 66; weathered mafic schist; prominent quartz vein; minor limonite stains.
PI 71	Chip	2 ft	Same adit as sample PI 66; mafic schist; intermixed quartz lenses up to 8 in. thick.
PI 72	Chip	1 ft	Same adit as sample PI 66; mafic schist; discontinuous shear with intermixed quartz and weathered schist; minor malachite and limonite stains.
PI 73	Chip	1 ft	Same adit as sample PI 66; mafic schist; quartz pod about 1 ft by 4 ft.
PI 74	Chip	2 ft	Same adit as sample PI 66; mafic schist; minor shear and limonite.
PI 75	Chip	3 ft	Same adit as sample PI 66; mafic schist.
PI 76	Chip	3 ft	Adit, 23 ft long; mafic, granitic schist, minor structure.

APPENDIX B

INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROSCOPY
MULTI- ELEMENT ANALYTICAL DATA FOR SAMPLES ANALYZED BY
CHEMEX LABS, INC.

Appendix B.—Inductively coupled plasma-atomic emission spectroscopy multi-element analytical data for samples analyzed by Chemex Labs, Inc.

[<, less than lower detection limit (some elements have elevated lower detection limits due to interference from other elements);
>, greater than; o/t, results, in ounces per ton, of overlimits rerun by fire assay; *, results of overlimits in %, rerun by AAS.]

Sample No.	Ag (Ppm)	Al (Pct)	As (Ppm)	Ba (Ppm)	Ba (Ppm)	Bi (Ppm)	Ca (Pct)	Cd (Ppm)	Co (Ppm)	Cr (Ppm)	Cu (Ppm)	Fe (Pct)	Ga (Ppm)	Hg (Ppm)	K (Pct)	La (Ppm)	Mg (Pct)	Mn (Ppm)	Mo (Ppm)	Na (Pct)	Ni (Ppm)	P (Ppm)	Pb (Ppm)	Sb (Ppm)	Sc (Ppm)	Sr (Ppm)	Ti (Pct)	Ti (Ppm)	U (Ppm)	V (Ppm)	W (Ppm)	Zn (Ppm)
PI 01	27.8	0.27	< 5	120	< 0.5	8	0.07	< 0.5	29	164	62	3.49	10	< 1	0.05	< 10	0.14	55	4	0.04	15	100	66	5	1	10	< 0.01	< 10	80	14	< 10	14
PI 02	6.0	0.23	< 5	410	< 0.5	14	0.03	1.5	4	217	159	1.41	20	< 1	0.07	< 10	0.05	50	13	0.04	7	20	268	5	< 1	15	< 0.01	< 10	100	11	< 10	12
PI 03	17.90 o/t	0.09	10	230	< 0.5	340	0.06	< 0.5	9	744 *	1.30%	3.02	10	1	< 0.01	< 10	0.01	85	96	0.04	23	< 200	= 1.88%	5	1	29	< 0.01	< 10	100	9	50	72
PI 04	6.62 o/t	0.06	< 5	< 10	< 0.5	464	0.07	1.5	< 1	265	583	1.05	< 10	< 1	< 0.01	< 10	0.03	185	9	0.02	4	< 10	= 1.35%	5	< 1	6	< 0.01	< 10	< 10	4	< 10	18
PI 05	9.6	0.30	< 5	20	< 0.5	154	0.05	< 0.5	2	243	249	1.86	< 10	< 1	0.14	< 10	0.09	145	24	0.02	7	40	370	5	< 1	5	< 0.01	< 10	< 10	18	< 10	26
PI 06	7.8	0.30	5	40	< 0.5	8	0.04	< 0.5	5	534	19	1.24	20	< 1	0.16	< 10	0.02	45	4	0.04	11	120	112	5	< 1	14	< 0.01	< 10	80	8	< 10	8
PI 07	8.96 o/t	0.21	< 5	40	< 0.5	16	0.02	< 0.5	25	844	34	3.65	20	< 1	0.04	< 10	0.03	55	13	0.05	21	60	5056	5	< 1	5	< 0.01	< 10	110	10	< 10	10
PI 08	20.8	0.19	5	20	< 0.5	10	0.02	< 0.5	3	427	18	1.18	10	1	0.06	< 10	0.01	35	11	0.07	15	< 10	340	5	< 1	7	< 0.01	< 10	90	6	< 10	6
PI 09	1.0	0.24	5	40	< 0.5	12	0.05	< 0.5	3	558	9	1.62	20	< 1	0.11	< 10	0.04	65	28	0.05	15	140	44	5	< 1	32	< 0.01	10	80	12	< 10	10
PI 10	0.8	2.65	5	270	< 0.5	2	0.26	< 0.5	12	291	8	3.63	40	< 1	1.31	10	0.84	460	9	0.15	38	620	14	5	4	233	0.10	< 10	110	40	< 10	118
PI 11	1.2	0.09	< 5	60	< 0.5	12	0.02	< 0.5	5	734	9	1.44	20	< 1	< 0.01	< 10	0.01	50	21	0.04	22	40	10	5	< 1	11	< 0.01	< 10	120	9	< 10	4
PI 12	< 0.8	1.47	< 5	170	< 0.5	4	0.92	< 0.5	8	331	2	2.39	20	< 1	0.84	10	0.30	370	16	0.08	7	610	14	5	2	30	0.04	< 10	120	23	< 10	42
PI 13	< 0.8	2.92	< 10	2320	< 0.5	2	0.93	< 0.5	48	270	30	4.27	40	< 1	1.35	20	1.59	695	24	0.10	84	1250	40	5	7	140	0.14	< 10	110	84	< 10	140
PI 14	0.8	3.34	15	30	< 0.5	6	1.84	< 0.5	30	29	145	10.79	< 10	< 1	0.08	30	1.71	1425	2	0.12	11	1680	40	5	25	64	0.61	< 10	< 10	304	20	164
PI 15	1.6	0.06	< 5	< 10	< 0.5	12	0.03	< 0.5	1	287	37	0.60	< 10	< 1	< 0.01	< 10	0.01	110	5	0.02	5	10	56	5	< 1	2	< 0.01	< 10	< 10	2	< 10	6
PI 16	1.6	0.03	< 5	< 10	< 0.5	2	0.02	< 0.5	1	269	21	0.45	< 10	4	< 0.01	< 10	< 0.01	55	5	0.02	5	< 10	10	5	< 1	1	< 0.01	< 10	< 10	2	< 10	6
PI 17	1.6	0.02	< 5	< 10	< 0.5	< 2	0.03	< 0.5	< 1	282	27	0.47	< 10	2	< 0.01	< 10	< 0.01	55	5	0.02	5	< 10	6	5	< 1	2	< 0.01	< 10	< 10	2	< 10	8
PI 18	1.6	0.03	< 5	< 10	< 0.5	< 2	0.03	< 0.5	< 1	308	25	0.49	< 10	< 1	< 0.01	< 10	< 0.01	55	5	0.02	6	< 10	8	5	< 1	1	< 0.01	< 10	10	3	< 10	6
PI 19	1.4	0.05	5	10	< 0.5	14	0.03	< 0.5	< 1	300	35	0.50	< 10	< 1	< 0.01	< 10	0.01	75	5	0.02	1	10	24	5	< 1	1	< 0.01	< 10	< 10	2	< 10	6
PI 20	1.4	0.06	< 5	20	< 0.5	< 2	0.03	< 0.5	< 1	313	29	0.50	< 10	< 1	< 0.01	< 10	< 0.01	75	6	0.02	7	10	38	5	< 1	2	< 0.01	< 10	< 10	2	< 10	4
PI 21	< 0.8	0.42	5	130	< 0.5	8	0.04	< 0.5	3	133	23	0.50	30	< 1	0.32	20	0.02	110	1	0.06	4	80	10	5	1	5	< 0.01	20	< 10	< 1	10	< 2
PI 22	0.8	4.72	< 5	670	< 0.5	< 2	1.63	2.0	35	207	111	5.84	50	< 1	0.03	50	1.77	1400	< 1	0.12	63	1750	22	5	24	138	0.19	< 10	< 10	107	< 10	140
PI 23	1.2	0.39	15	30	< 0.5	6	0.04	0.5	1	120	10	0.78	< 10	< 1	0.25	20	0.02	240	3	0.04	2	60	28	5	1	2	< 0.01	< 10	< 10	2	< 10	30
PI 24	37.8	0.46	< 5	70	0.5	62	0.09	0.5	2	157	150	0.70	< 10	< 1	0.29	40	0.05	525	10	0.04	< 1	120	3000	5	1	4	< 0.01	< 10	< 10	4	< 10	86
PI 25	4.8	0.46	< 5	30	< 0.5	8	0.09	0.5	1	269	318	1.50	< 10	< 1	0.24	20	0.07	240	8	0.04	7	100	340	5	1	3	< 0.01	< 10	< 10	4	< 10	100
PI 26	1.2	0.68	< 5	30	< 0.5	2	0.09	< 0.5	< 1	143	6	0.92	< 10	< 1	0.20	20	0.07	80	2	0.04	6	< 10	< 2	5	1	5	< 0.01	< 10	< 10	6	< 10	4
PI 27	1.4	0.61	< 5	40	< 0.5	6	0.07	< 0.5	< 1	100	3	1.05	< 10	< 1	0.22	50	0.10	170	4	0.05	< 1	80	6	5	1	4	< 0.01	< 10	< 10	3	< 10	24
PI 28	2.0	2.75	15	90	1.0	< 2	0.75	< 0.5	44	103	6	7.30	< 10	< 1	0.74	40	0.82	2250	5	0.04	40	960	< 2	5	13	21	0.03	< 10	< 10	65	< 10	182
PI 29	4.4	0.45	5	30	0.5	8	0.04	< 0.5	< 1	197	77	1.80	< 10	< 1	0.22	10	0.06	85	5	0.02	2	90	250	5	1	5	< 0.01	< 10	< 10	8	< 10	18
PI 30	1.6	1.60	< 5	80	2.5	8	1.02	< 0.5	8	87	8	3.41	< 10	< 1	0.60	60	0.51	2315	12	0.04	12	530	< 2	5	5	24	0.01	< 10	< 10	17	< 10	72
PI 31	3.2	2.24	< 5	60	2.0	8	0.87	< 0.5	11	147	91	5.33	< 10	< 1	0.50	50	0.93	1165	6	0.09	12	420	268	10	4	13	0.04	< 10	< 10	24	< 10	158
PI 32	2.0	2.68	< 5	60	2.0	4	0.33	< 0.5	8	140	90	5.73	< 10	< 1	0.53	50	1.03	1445	5	0.04	6	420	240	5	4	11	0.05	< 10	< 10	17	< 10	164
PI 33	1.6	0.94	5	30	2.5	< 2	0.08	< 0.5	< 1	90	11	1.94	< 10	< 1	0.14	50	0.32	115	2	0.04	< 1	40	10	5	1	5	< 0.01	< 10	< 10	2	< 10	56
PI 34	2.4	0.94	< 5	20	5.5	6	0.11	< 0.5	< 1	85	6	1.96	< 10	< 1	0.21	50	0.33	275	1	0.05	< 1	20	22	5	1	3	0.01	< 10	< 10	2	< 10	60
PI 35	2.2	0.48	< 5	20	0.5	10	0.13	< 0.5	< 1	122	11	0.92	< 10	< 1	0.17	60	0.08	195	3	0.07	< 1	70	6	5	1	3	0.01	< 10	< 10	1	< 10	34
PI 36	1.8	0.56	< 5	40	1.0	10	0.20	0.5	< 1	112	9	1.11	< 10	< 1	0.23	50	0.09	240	1	0.07	3	150	24	5	2	3	0.01	< 10	< 10	3	< 10	36
PI 37	2.0	0.48	< 5	20	0.5	< 2	0.07	< 0.5	5	137	15	1.08	< 10	< 1	0.19	50	0.07	90	2	0.05	< 2	50	< 2	5	1	4	0.01	< 10	< 10	7	< 10	12
PI 38	1.2	0.41	< 5	20	< 0.5	6	0.06	< 0.5	< 1	83	8	0.71	< 10	1	0.20	20	0.05	40	2	0.05	< 1	30	16	5	1	4	< 0.01	< 10	< 10	2	< 10	6
PI 39	< 0.8	2.04	< 5	* 2.68%	< 0.5	8	0.94	< 0.5	14	279	1118	2.57	30	< 1	0.57	40	1.33	570	< 1	0.05	30	1550	24	5	6	397	0.01	10	< 10	44	< 10	92
PI 40	1.8	0.69	< 5	* 3.35%	< 0.5	20	0.07	< 0.5	12	108	6071	1.24	30	< 1	0.37	20	0.15	120	< 1	0.06	3	320	12	5	1	337	< 0.01	< 10	< 10	7	< 10	18
PI 41	1.2	0.50	5	< 10	< 0.5	6	0.11	< 0.5	2	85	< 1	1.30	40	< 1	0.15	20	0.05	150	1	0.14	1	80	46	5	3	2	0.03	40	< 10	3	< 10	90
PI 42	< 0.8	0.71	5	10	< 0.5	6	0.45	< 0.5	4	47	< 1	1.58	50	< 1	0.27	50	0.25	455	1	0.10	2	400	28	5	6	8	0.05	10	< 10	13	< 10	84
PI 43	0.8	0.73	< 5	20	< 0.5	2	0.39	< 0.5	5	48	< 1	1.70	40	< 1	0.29	50	0.24	440	1	0.10	3	480	20	5	6							

Appendix B.--Inductively coupled plasma-atomic emission spectroscopy multi-element analytical data for samples analyzed by Chemex Labs, Inc.--Continued

Sample No.	Ag (Ppm)	Al (Pct)	As (Ppm)	Ba (Ppm)	Be (Ppm)	Bi (Ppm)	Ca (Pct)	Cd (Ppm)	Co (Ppm)	Cr (Ppm)	Cu (Ppm)	Fe (Pct)	Ga (Ppm)	Hg (Ppm)	K (Pct)	La (Ppm)	Mg (Pct)	Mn (Ppm)	Mo (Ppm)	Na (Pct)	Ni (Ppm)	P (Ppm)	Pb (Ppm)	Sb (Ppm)	Sc (Ppm)	Sr (Ppm)	Ti (Pct)	Tl (Ppm)	U (Ppm)	V (Ppm)	W (Ppm)	Zn (Ppm)
PI 44	0.2	1.51	5	130	< 0.5	< 2	0.18	< 0.5	14	37	48	2.64	< 10	3	0.04	10	0.05	40	3	0.03	38	930	4	5	1	322	0.01	< 10	< 10	25	< 10	20
PI 45	6.6	0.67	15	10	0.5	< 2	0.07	< 0.5	< 1	83	1932	0.36	< 10	< 1	0.37	30	0.05	170	4	0.03	3	40	34	5	1	10	0.02	< 10	< 10	7	< 10	30
PI 46	47.4	0.86	< 5	10	2.5	< 20	0.12	< 0.5	7	37	* 3.92%	0.40	10	1	0.42	30	0.04	140	5	0.03	< 1	< 200	74	5	2	11	0.02	< 10	< 10	24	< 10	208
PI 47	117.4	3.49	3345	530	3.5	< 20	3.59	< 0.5	3	89	* 7.70%	3.38	10	2	2.91	40	0.52	365	< 1	0.42	19	600	32	15	6	113	0.15	10	< 10	315	< 50	118
PI 48	9.2	5.05	< 5	40	< 0.5	30	3.84	6.5	54	47	2265	11.94	50	< 1	0.32	20	3.22	4935	3	0.23	53	940	458	10	21	23	0.16	< 10	< 10	207	40	956
PI 49	13.0	3.65	< 5	10	< 0.5	24	4.36	19.0	54	53	786	9.45	60	< 1	0.18	20	3.65	5600	< 1	0.08	69	960	1606	10	25	36	0.63	30	< 10	243	< 10	2514
PI 50	2.4	3.99	< 5	< 10	< 0.5	< 2	0.48	4.0	47	53	225	9.11	50	< 1	0.09	10	3.36	4955	7	0.06	54	840	2018	10	22	7	0.32	20	< 10	220	< 10	4536
PI 51	23.0	0.99	< 5	< 10	< 0.5	78	0.90	>100.0	49	51	1016	2.74	40	< 1	0.10	10	0.64	2640	2	0.06	7	780	* 6.85%	5	4	6	0.03	50	< 10	41	250	* 17.10%
PI 52	21.0	1.24	5	70	< 0.5	4	1.42	2.5	7	94	79	1.59	10	< 1	0.37	40	0.68	680	2	0.01	13	850	378	5	2	26	< 0.01	< 10	< 10	18	< 10	888
PI 53	2.4	1.49	< 5	80	< 0.5	6	4.25	10.0	5	45	35	1.30	30	< 1	0.67	30	0.70	895	< 1	0.07	3	490	342	5	3	17	< 0.01	< 10	< 10	14	< 10	680
PI 54	28.8	1.90	90	10	< 0.5	580	0.90	< 0.5	21	30	* 2.70%	9.23	50	< 1	0.13	30	0.90	720	2	0.07	26	1740	908	5	6	41	0.23	30	< 10	95	< 10	152
PI 55	1.8	1.90	145	20	< 0.5	6	0.21	3.0	11	43	292	3.53	50	< 1	0.17	40	0.63	620	3	0.04	15	1040	5734	5	3	43	0.03	30	< 10	674	20	5938
PI 56	2.0	2.35	5	10	< 0.5	6	1.12	6.0	51	18	1580	4.24	40	< 1	0.18	40	1.18	900	52	0.07	35	1600	116	5	6	25	0.26	< 10	< 10	78	< 10	772
PI 57	< 0.8	0.95	5	70	< 0.5	8	0.20	< 0.5	17	81	659	3.53	20	< 1	0.54	10	0.43	450	10	0.06	13	720	1690	5	2	11	0.03	< 10	< 10	77	< 10	132
PI 58	1.6	1.77	15	80	< 0.5	< 2	0.35	1.0	18	99	545	3.87	20	< 1	1.01	20	1.31	915	68	0.09	29	1220	3440	5	4	25	0.13	10	< 10	92	10	702
PI 59	< 0.8	2.43	< 5	120	< 0.5	2	0.83	2.5	23	67	174	6.75	30	< 1	0.48	10	1.12	1630	8	0.05	31	2080	686	5	6	34	0.02	< 10	< 10	64	< 10	402
PI 60	< 0.8	0.52	< 5	40	< 0.5	< 2	0.07	< 0.5	6	122	34	0.94	30	< 1	0.31	20	0.08	120	2	0.07	2	230	464	5	1	4	0.01	10	< 10	31	10	14
PI 61	< 0.8	0.31	< 5	10	< 0.5	60	0.08	0.5	22	152	* 5.07%	6.68	20	< 1	0.06	< 10	0.04	190	17	0.03	25	560	244	5	3	6	< 0.01	60	< 10	141	< 50	208
PI 62	1.6	1.12	< 5	80	< 0.5	10	0.25	< 0.5	17	81	4172	3.74	20	< 1	0.19	10	0.26	440	12	0.04	27	650	32	5	4	16	0.01	< 10	< 10	32	< 10	102
PI 63	1.4	0.55	< 5	30	< 0.5	12	0.48	< 0.5	7	105	169	3.51	70	< 1	0.13	240	0.14	350	< 1	0.09	3	910	32	5	9	8	0.25	60	< 10	51	< 10	24
PI 64	< 0.8	0.44	< 5	50	< 0.5	8	0.32	< 0.5	72	219	1045	4.58	20	< 1	0.16	80	0.28	135	5	0.06	131	1320	12	5	2	8	0.06	< 10	< 10	37	< 10	26
PI 65	< 0.8	2.87	< 5	790	< 0.5	< 2	1.42	< 0.5	49	278	726	>15.00	30	< 1	2.94	90	1.84	735	1	0.10	404	8380	12	15	6	218	0.56	20	< 10	173	< 10	152
PI 66	< 0.8	1.38	< 5	110	< 0.5	6	1.62	< 0.5	24	87	353	6.29	40	< 1	0.19	10	0.94	435	< 1	0.26	22	1910	4	5	13	48	0.54	< 10	120	226	< 10	58
PI 67	< 0.8	1.74	< 5	130	< 0.5	4	1.28	< 0.5	26	64	183	4.05	30	1	0.62	10	1.34	355	< 1	0.18	33	1520	10	5	8	73	0.33	< 10	110	141	< 10	62
PI 68	< 0.8	0.40	< 5	10	< 0.5	10	0.19	< 0.5	23	154	735	0.99	20	< 1	0.07	< 10	0.10	50	6	0.18	11	80	10	5	1	26	0.02	< 10	80	39	< 10	10
PI 69	< 0.8	1.86	< 5	190	< 0.5	< 2	1.76	< 0.5	29	54	666	2.65	40	< 1	0.33	10	1.75	305	< 1	0.32	44	580	4	5	11	112	0.35	< 10	140	113	< 10	48
PI 70	< 0.8	0.41	< 5	10	0.5	4	0.12	< 0.5	2	132	48	0.53	20	< 1	0.21	< 10	0.10	55	2	0.18	7	50	6	5	1	8	0.02	< 10	110	10	< 10	8
PI 71	< 0.8	0.41	< 5	< 10	< 0.5	< 2	0.11	< 0.5	2	101	29	0.55	20	< 1	0.25	< 10	0.09	70	2	0.20	4	20	12	5	1	8	0.02	< 10	100	9	< 10	10
PI 72	< 0.8	3.27	5	380	< 0.5	< 2	2.24	< 0.5	41	72	1115	4.88	40	1	2.58	10	3.76	735	< 1	0.29	79	400	10	5	14	68	0.62	< 10	100	188	< 10	154
PI 73	< 0.8	1.22	< 5	90	< 0.5	2	1.25	< 0.5	16	84	422	1.83	30	< 1	0.46	10	1.10	300	< 1	0.32	23	150	10	5	7	33	0.21	< 10	120	75	< 10	34
PI 74	< 0.8	2.13	< 5	110	< 0.5	4	2.94	< 0.5	26	68	397	4.48	30	8	0.43	10	1.74	415	< 1	0.21	32	1430	8	5	11	143	0.41	< 10	160	161	< 10	64
PI 75	< 0.8	1.73	5	190	< 0.5	8	1.66	< 0.5	17	56	81	2.55	30	< 1	0.48	10	1.41	325	< 1	0.28	29	1100	10	5	6	94	0.28	< 10	110	84	< 10	46
PI 76	< 0.8	2.38	< 5	180	< 0.5	< 2	1.54	< 0.5	23	145	5	3.41	40	< 1	0.63	10	1.97	470	< 1	0.24	42	1100	10	5	9	88	0.37	< 10	130	106	< 10	60

APPENDIX C

NEUTRON ACTIVATION MULTI-ELEMENT ANALYTICAL DATA FOR
SAMPLES ANALYZED BY BONDAR-CLEGG & COMPANY LTD.

Appendix C.-Neutron activation multi-element analytical data for samples analyzed by Bondar-Clegg & Company Ltd.

[<, less than lower detection limit (some elements have elevated lower detection limits due to interference from other elements); >, greater than; __, rerun values are given in Appendix B; o/t, results, in ounces per ton, of overlimits rerun by fire assay.]

Sample No.	Ag (Ppm)	As (Ppm)	Au (Ppb)	Ba (Ppm)	Br (Ppm)	Cd (Ppm)	Ce (Ppm)	Co (Ppm)	Cr (Ppm)	Cs (Ppm)	Eu (Ppm)	Fe (Pct)	Hf (Ppm)	Ir (Ppb)	La (Ppm)	Lu (Ppm)	Mo (Ppm)	Na (Pct)	Ni (Ppm)	Rb (Ppm)	Sb (Ppm)	Sc (Ppm)	Se (Ppm)	Sm (Ppm)	Sr (Ppm)	Ta (Ppm)	Tb (Ppm)	Te (Ppm)	Th (Ppm)	U (Ppm)	W (Ppm)	Yb (Ppm)	Zn (Ppm)	Zr (Ppm)
PI 01	31	2	1460	170	< 01	< 10	10	31	240	< 1	< 2	2.7	< 2	< 100	< 5	< 0.5	4	0.07	< 20	< 10	< 0.2	1.3	< 10	0.5	< 200	< 1	< 1	21	< 0.5	< 0.5	9	< 5	< 200	< 500
PI 02	8	2	893	360	< 1	< 10	10	< 10	270	< 1	< 2	1.2	< 2	< 100	< 5	< 0.5	13	< 0.05	< 20	15	0.2	0.9	< 10	0.8	< 200	< 1	< 1	< 20	1.1	0.7	2	< 5	< 200	< 500
PI 03	>100	< 1	0.722 o/t	220	65	< 10	10	< 10	840	< 1	< 2	2.3	< 2	< 100	< 5	< 0.5	88	< 0.05	< 20	< 10	0.5	< 0.5	< 10	< 0.2	< 200	< 1	< 1	390	< 0.5	3.2	10	< 5	< 200	< 500
PI 04	> 50	2	360	< 100	3	< 10	10	< 10	470	< 1	< 2	1.0	< 2	< 100	< 5	< 0.5	18	< 0.05	< 50	< 10	0.8	< 0.5	19	< 0.2	< 200	< 1	< 1	110	< 0.5	< 0.5	5	< 5	< 200	< 500
PI 05	17	2	626	< 100	< 1	< 10	10	< 10	450	1	< 2	1.7	< 2	< 100	< 5	< 0.5	33	0.08	< 50	47	0.4	1.7	< 10	1.0	< 200	< 1	< 1	< 20	1.1	1.6	7	< 5	< 200	< 500
PI 06	7	< 1	975	150	< 1	< 10	10	< 10	810	< 1	< 2	1.3	< 2	< 100	< 5	< 0.5	7	0.09	< 20	39	0.4	2.0	< 10	1.0	< 200	< 1	< 1	< 20	0.9	0.5	4	< 5	< 200	< 500
PI 07	>100	< 1	1.316 o/t	< 100	87	< 10	23	26	1300	< 1	< 2	3.3	< 2	< 100	< 5	< 0.5	12	< 0.05	< 20	< 10	< 0.2	< 0.5	< 10	0.5	< 200	< 1	< 1	200	0.8	0.7	< 2	< 5	< 200	< 500
PI 08	20	< 1	1990	< 100	< 1	< 10	10	< 10	710	< 1	< 2	1.1	< 2	< 100	< 5	< 0.5	13	0.41	< 20	29	< 0.2	1.0	< 10	1.0	< 200	< 1	< 1	25	4.5	1.1	3	< 5	< 200	< 500
PI 09	< 5	< 1	6	< 100	1	< 10	10	< 10	810	< 1	< 2	1.5	< 2	< 100	< 5	< 0.5	30	< 0.05	< 20	20	< 0.2	1.0	< 10	0.7	< 200	< 1	< 1	< 20	< 0.5	0.6	2	< 5	< 200	< 500
PI 10	< 5	1	< 5	450	11	< 10	20	< 10	420	3	< 2	3.6	5	< 100	11	1.0	10	1.20	< 20	160	< 0.2	8.8	< 10	3.3	< 200	< 1	1	< 20	7.5	3.8	5	7	< 200	< 500
PI 11	< 5	1	8	< 100	< 1	< 10	10	< 10	1000	< 1	< 2	1.3	< 2	< 100	< 5	< 0.5	24	< 0.05	< 20	< 10	< 0.2	< 0.5	< 10	0.3	< 200	< 1	< 1	< 20	< 0.5	< 0.5	3	< 5	< 200	< 500
PI 12	< 5	< 1	< 5	400	2	< 10	21	< 10	470	2	< 2	2.9	3	< 100	10	0.7	16	0.37	< 20	150	< 0.2	5.9	< 10	3.5	< 200	< 1	< 1	< 20	5.1	1.5	5	< 5	< 200	< 500
PI 13	< 5	< 1	8	2000	6	< 10	42	48	350	6	< 2	3.8	4	< 100	22	0.5	23	1.10	39	100	0.3	8.1	< 10	6.5	< 200	< 1	1	< 20	4.9	2.0	4	< 5	< 200	< 500
PI 14	< 5	13	18	130	< 1	< 10	42	49	< 50	7	< 2	>10.0	4	< 100	16	0.8	< 2	1.90	< 50	31	6.3	43.0	< 10	8.4	< 200	1	2	< 20	1.6	0.6	27	6	210	< 500
PI 15	< 5	< 1	15	< 100	< 1	< 10	10	< 10	550	4	< 2	0.6	< 2	< 100	< 5	< 0.5	9	< 0.05	< 50	< 10	6.3	1.1	< 10	0.6	< 200	< 1	< 1	< 20	< 0.5	< 0.5	7	< 5	< 200	< 500
PI 16	< 5	< 1	< 5	< 100	2	< 10	10	< 10	530	< 1	< 2	< 0.5	< 2	< 100	< 5	< 0.5	10	< 0.05	< 50	< 10	0.6	< 0.5	< 10	< 0.2	< 200	< 1	< 1	< 20	< 0.5	< 0.5	3	< 5	< 200	< 500
PI 17	< 5	2	< 5	< 100	7	< 10	10	< 10	630	< 1	< 2	< 0.5	< 2	< 100	< 5	< 0.5	11	< 0.05	< 50	< 10	0.6	< 0.5	< 10	< 0.2	< 200	< 1	< 1	< 20	< 0.5	< 0.5	< 2	< 5	< 200	< 500
PI 18	< 5	2	< 5	< 100	2	< 10	10	< 10	610	< 1	< 2	< 0.5	< 2	< 100	< 5	< 0.5	9	< 0.05	< 50	< 10	0.5	< 0.5	< 10	< 0.2	< 200	< 1	< 1	< 20	< 0.5	< 0.5	2	< 5	< 200	< 500
PI 19	< 5	2	6	< 100	< 1	< 10	10	< 10	500	< 1	< 2	< 0.5	< 2	< 100	< 5	< 0.5	9	< 0.05	< 50	< 10	0.7	< 0.5	< 10	< 0.2	< 200	< 1	< 1	< 20	< 0.5	< 0.5	2	< 5	< 200	< 500
PI 20	< 5	2	< 5	< 100	< 1	< 10	10	< 10	620	< 1	< 2	< 0.5	< 2	< 100	< 5	< 0.5	11	0.06	< 50	< 10	0.7	< 0.5	< 10	< 0.2	< 200	< 1	< 1	< 20	< 0.5	< 0.5	< 2	< 5	< 200	< 500
PI 21	< 5	< 1	20	300	< 1	< 10	51	< 10	210	3	< 2	0.6	2	< 100	22	0.8	2	0.86	< 20	110	0.2	3.6	< 10	4.2	< 200	< 1	< 1	< 20	11.0	1.7	5	< 5	< 200	< 500
PI 22	< 5	2	5	930	1	< 10	60	40	280	1	< 2	5.5	3	< 100	56	1.6	< 2	1.90	37	98	0.5	25.0	< 10	7.4	< 200	< 1	2	< 20	4.9	22.0	2	6	< 200	< 500
PI 23	< 5	< 1	170	630	< 1	< 10	68	< 10	280	3	< 2	1.1	4	< 100	19	0.6	4	1.60	< 50	200	< 0.2	4.9	< 10	4.9	< 200	< 1	1	< 20	12.0	1.8	13	< 5	< 200	630
PI 24	43	< 1	918	660	< 1	< 10	83	< 10	320	3	< 2	1.0	5	< 100	38	0.8	13	1.10	< 50	200	0.2	4.7	< 10	8.0	< 200	< 1	2	< 20	13.0	1.9	14	< 5	< 200	< 500
PI 25	5	7	430	400	< 1	< 10	39	< 10	550	1	< 2	1.6	3	< 100	18	< 0.5	10	1.00	< 50	130	0.4	3.4	< 10	4.2	< 200	< 1	< 1	< 20	8.6	1.5	13	< 5	< 200	< 500
PI 26	< 5	< 1	29	390	< 1	< 10	66	< 10	280	2	< 2	1.2	3	< 100	24	1.0	3	1.80	< 50	120	< 0.2	3.0	< 10	5.3	< 200	1	1	< 20	15.0	2.1	10	7	< 200	< 500
PI 27	< 5	< 1	27	560	< 1	< 10	100	< 10	170	3	< 2	1.2	4	< 100	48	1.0	4	2.00	< 50	200	0.3	5.8	< 10	9.4	< 200	2	1	< 20	17.0	2.5	5	6	< 200	520
PI 28	< 5	2	934	290	< 1	< 10	76	58	250	6	< 2	7.4	6	< 100	31	< 0.5	3	0.74	< 50	320	0.8	26.0	< 10	10.0	< 200	< 1	2	< 20	8.7	26.0	57	8	< 200	< 500
PI 29	< 5	2	1220	150	< 1	< 10	17	< 10	370	2	< 2	1.8	< 2	< 100	11	< 0.5	8	0.13	< 50	100	0.3	3.5	< 10	2.5	< 200	< 1	< 1	< 20	4.7	3.4	9	< 5	< 200	< 500
PI 30	< 5	< 1	< 5	350	< 1	< 10	98	13	210	10	< 2	4.0	5	< 100	42	1.2	12	0.76	< 50	310	0.6	11.0	< 10	11.0	< 200	2	3	< 20	19.0	14.0	7	14	< 200	< 500
PI 31	< 5	1	2200	210	19	< 10	80	14	260	5	< 2	4.9	3	< 100	34	1.6	4	0.22	< 50	190	0.4	6.3	< 10	10.0	< 200	2	3	< 20	19.0	7.3	17	10	< 200	< 500
PI 32	< 5	1	75	310	2	< 10	110	14	270	4	< 2	5.7	5	< 100	44	1.9	3	0.14	< 50	210	0.4	7.6	< 10	11.0	< 200	2	2	< 20	20.0	5.8	23	13	< 200	< 500
PI 33	< 5	< 1	< 5	350	< 1	< 10	87	< 10	180	5	< 2	1.6	3	< 100	42	1.5	< 2	1.60	< 50	250	0.2	2.7	< 10	9.4	< 200	3	2	< 20	23.0	4.4	< 2	8	< 200	< 500
PI 34	< 5	< 1	< 5	500	< 1	< 10	100	< 10	180	2	< 2	2.0	3	< 100	47	1.0	< 2	1.40	< 50	220	< 0.2	3.1	< 10	11.0	< 200	1	3	< 20	22.0	3.8	4	7	< 200	< 500
PI 35	< 5	< 1	< 5	400	3	< 10	120	< 10	240	2	< 2	0.8	4	< 100	52	0.7	< 2	1.90	< 50	200	< 0.2	3.9	< 10	10.0	< 200	1	2	< 20	16.0	2.4	< 2	< 5	< 200	< 500
PI 36	< 5	< 1	< 5	570	< 1	< 10	89	< 10	210	4	< 2	1.3	5	< 100	39	1.2	< 2	2.10	< 50	190	0.4	6.7	< 10	10.0	< 200	3	2	< 20	19.0	4.7	3	9	< 200	620
PI 37	< 5	< 1	18	260	< 1	< 10	96	< 10	220	2	< 2	1.3	5	< 100	42	1.0	3	1.60	< 50	210	0.3	3.7	< 10	8.8	< 200	< 1	2	< 20	23.0	3.6	5	6	< 200	< 500
PI 38	< 5	< 1	11	470	< 1	< 10	18	< 10	140	3	< 2	0.9	5	< 100	15	1.1	< 2	1.80	< 50	300	< 0.2	3.7	< 10	3.3	< 200	< 1	2	< 20	19.0	2.2	3	7	< 200	<

Appendix C.--Neutron activation multi-element analytical data for samples analyzed by Bondar-Clegg & Company Ltd.--Continued

Sample No.	Ag (Ppm)	As (Ppm)	Au (Ppb)	Ba (Ppm)	Br (Ppm)	Cd (Ppm)	Ce (Ppm)	Co (Ppm)	Cr (Ppm)	Cs (Ppm)	Eu (Ppm)	Fe (Pct)	Hf (Ppm)	Ir (Ppb)	La (Ppm)	Lu (Ppm)	Mo (Ppm)	Na (Pct)	Ni (Ppm)	Rb (Ppm)	Sb (Ppm)	Sc (Ppm)	Se (Ppm)	Sm (Ppm)	Sn (Ppm)	Ta (Ppm)	Tb (Ppm)	Ta (Ppm)	Th (Ppm)	U (Ppm)	W (Ppm)	Yb (Ppm)	Zn (Ppm)	Zr (Ppm)
PI 44	< 5	11	< 5	290	< 1	< 10	69	12	140	< 1	< 2	2.3	5	< 100	34	< 0.5	4	0.08	< 50	11	0.4	10.0	< 10	7.2	< 200	2	1	< 20	8.5	3.2	< 2	< 5	< 200	< 500
PI 45	26	2	< 5	340	< 1	< 10	46	< 10	170	8	< 2	0.6	2	< 100	34	< 0.5	4	0.25	< 50	590	1.0	1.7	< 10	1.1	< 200	3	< 1	< 20	40.0	6.1	< 2	< 5	< 200	< 500
PI 46	> 50	9	85	270	< 1	< 10	59	< 10	58	8	< 2	0.6	3	< 100	35	< 0.5	5	0.27	< 50	520	1.7	1.9	< 10	1.6	< 200	2	< 1	< 20	33.0	9.4	2	< 5	< 200	< 500
PI 47	>100	3250	< 19	1100	43	< 26	58	< 10	100	12	< 2	4.1	< 5	< 100	39	< 0.5	< 5	1.10	< 67	540	22.2	5.3	< 23	5.0	< 430	< 1	< 1	< 55	11.0	6.7	10	9	370	< 1000
PI 48	8	2	6	110	< 1	< 10	20	61	53	4	< 2	>10.0	2	< 100	13	< 0.5	3	1.60	41	58	1.5	28.0	< 10	3.5	< 200	< 1	< 1	< 20	4.1	14.0	66	< 5	650	< 500
PI 49	14	2	10	260	< 1	13	21	63	< 50	4	< 2	8.8	3	< 100	10	< 0.5	< 2	1.70	56	80	2.8	30.0	< 10	4.3	< 200	< 1	< 1	< 20	0.9	0.9	7	< 5	1400	< 500
PI 50	< 5	3	7	170	< 1	< 10	12	51	64	2	< 2	7.7	< 2	< 100	7	< 0.5	8	1.00	45	43	1.9	24.0	< 10	3.0	< 200	< 1	< 1	< 20	0.8	0.8	8	< 5	3500	< 500
PI 51	27	5	220	< 100	< 1	1320	10	43	100	2	< 2	2.1	< 2	< 100	< 5	< 0.5	< 2	0.06	< 20	< 10	7.6	3.8	< 10	0.5	< 200	< 1	< 1	< 20	< 0.5	2.6	10	< 5	>20000	< 500
PI 52	< 5	323	7	3100	< 1	< 10	33	29	< 50	50	< 2	6.3	< 2	< 100	14	< 0.5	5	0.15	< 50	290	11.0	20.0	< 10	5.1	< 200	< 1	< 1	< 20	3.0	1.9	7	< 5	7000	< 500
PI 53	9	4	180	420	< 1	< 10	55	< 10	97	24	< 2	1.4	4	< 100	28	1.1	< 2	0.95	< 20	200	18.0	6.1	< 10	4.9	< 200	2	1	< 20	14.0	3.0	< 2	8	500	< 500
PI 54	30	93	5	930	< 1	< 10	81	21	< 50	4	< 2	8.0	5	< 100	44	< 0.5	< 2	2.10	24	160	2.3	7.3	< 10	7.2	< 200	1	1	< 20	13.0	6.9	5	< 5	< 200	< 500
PI 55	< 5	139	34	410	2	< 10	68	11	66	14	2	3.0	5	< 100	40	< 0.5	3	0.27	28	320	14.0	5.9	< 10	6.7	< 200	< 1	1	< 20	12.0	7.1	31	< 5	4700	< 500
PI 56	< 5	6	< 5	500	< 1	< 10	93	53	< 50	34	2	3.9	6	< 100	47	< 0.5	50	1.60	28	220	2.4	9.5	< 10	6.9	< 200	2	1	< 20	18.0	17.0	13	< 5	520	< 500
PI 57	< 5	10	2730	150	< 1	< 10	30	18	160	2	< 2	3.7	< 2	< 100	12	1.6	11	1.10	< 20	140	0.2	7.0	< 10	0.9	< 200	< 1	< 1	< 20	7.7	33.0	20	< 5	< 200	< 500
PI 58	< 5	8	2600	330	< 1	< 10	72	17	210	4	< 2	4.2	3	< 100	37	1.1	67	0.55	29	230	0.4	12.0	< 10	5.9	< 200	< 1	1	< 20	20.0	23.0	16	< 5	520	< 500
PI 59	< 5	9	44	320	< 1	< 10	18	22	180	4	< 2	6.6	< 2	< 100	11	1.9	6	0.15	30	220	0.4	22.0	< 10	0.9	< 200	< 1	< 1	< 20	3.7	34.0	15	6	230	< 500
PI 60	< 5	3	25	280	< 1	< 10	53	< 10	170	1	< 2	1.0	3	< 100	25	< 0.5	3	1.00	< 20	94	< 0.2	2.9	< 10	4.0	< 200	< 1	< 1	< 20	15.0	5.1	4	< 5	< 200	< 500
PI 61	8	4	96	< 100	< 1	< 10	10	21	200	< 1	< 2	5.4	< 2	< 100	< 5	< 0.5	16	< 0.05	30	< 10	0.2	1.6	< 10	< 1.4	< 200	< 1	< 1	< 20	< 0.5	50.0	2	< 5	< 200	< 500
PI 62	< 5	1	15	200	< 1	< 10	20	19	120	< 1	< 2	3.1	2	< 100	15	< 0.5	13	0.27	< 20	33	< 0.2	6.6	< 10	2.8	< 200	< 1	< 1	< 20	3.2	9.3	< 2	< 5	< 200	< 500
PI 63	< 5	< 1	< 5	< 370	< 1	< 10	1580	< 10	340	< 1	< 2	3.6	67	< 100	805	16.0	< 5	1.70	< 20	14	< 0.2	23.0	< 10	129.0	< 200	35	18	< 20	564.0	112.0	4	51	< 200	2200
PI 64	< 5	< 1	16	< 100	< 1	< 10	340	74	350	< 1	< 2	3.8	45	< 100	170	0.7	7	0.13	97	< 10	< 0.2	2.9	< 10	28.4	< 200	< 1	3	< 20	67.9	5.5	2	< 5	< 200	1400
PI 65	< 5	2	15	640	4	< 10	550	55	410	3	2	>10.0	70	< 100	300	2.2	< 2	0.09	300	94	< 0.2	21.0	< 10	48.5	< 200	< 1	7	< 20	78.7	5.5	< 2	14	< 200	1800
PI 66	< 5	1	12	170	< 1	< 10	30	30	110	< 1	< 2	6.6	5	< 100	12	0.5	3	2.40	20	12	< 0.2	26.0	< 10	8.3	< 200	1	2	< 20	2.6	1.4	< 2	< 5	< 200	< 500
PI 67	< 5	< 1	< 5	160	< 1	< 10	28	31	100	3	< 2	4.9	3	< 100	12	< 0.5	< 2	2.50	24	41	< 0.2	20.0	< 10	5.9	< 200	1	< 1	< 20	1.5	1.6	< 2	< 5	< 200	< 500
PI 68	< 5	< 1	13	< 100	< 1	< 10	17	24	220	< 1	< 2	0.8	3	< 100	8	< 0.5	7	3.90	< 20	10	< 0.2	3.3	< 10	3.9	< 200	1	< 1	< 20	6.9	5.7	< 2	< 5	< 200	< 500
PI 69	< 5	< 1	17	270	< 1	< 10	21	49	100	1	< 2	4.6	2	< 100	11	< 0.5	< 2	2.90	54	23	< 0.2	25.0	< 10	5.2	< 200	< 1	< 1	< 20	3.6	1.6	< 2	< 5	< 200	< 500
PI 70	< 5	< 1	7	110	1	< 10	13	< 10	210	< 1	< 2	0.7	< 2	< 100	7	< 0.5	5	3.10	< 20	50	< 0.2	2.0	< 10	2.1	< 200	< 1	< 1	< 20	5.0	1.5	< 2	< 5	< 200	< 500
PI 71	< 5	< 1	< 5	< 100	< 1	< 10	16	< 10	190	< 1	< 2	0.6	< 2	< 100	7	< 0.5	5	2.80	< 20	62	< 0.2	1.5	< 10	2.9	< 200	1	< 1	< 20	6.9	4.3	< 2	< 5	< 200	< 500
PI 72	< 5	< 1	52	350	< 1	< 10	22	44	97	16	< 2	4.8	< 2	< 100	11	< 0.5	< 2	3.40	71	180	< 0.2	25.0	< 10	5.0	< 200	1	1	< 20	3.1	5.3	< 2	< 5	< 200	< 500
PI 73	< 5	< 1	12	< 100	< 1	< 10	28	26	140	1	< 2	2.8	3	< 100	11	< 0.5	2	3.20	32	58	< 0.2	15.0	< 10	5.2	< 200	2	< 1	< 20	5.8	3.9	< 2	< 5	< 200	< 500
PI 74	< 5	< 1	< 5	300	< 1	< 10	32	44	120	1	< 2	7.2	< 2	< 100	15	< 0.5	< 2	2.10	36	32	< 0.2	31.0	< 10	6.1	< 200	< 1	1	< 20	< 0.5	0.7	< 2	< 5	< 200	< 500
PI 75	< 5	< 1	< 5	270	< 1	< 10	40	31	110	2	< 2	4.5	< 2	< 100	16	< 0.5	< 2	3.10	33	15	< 0.2	17.0	< 10	4.9	< 200	1	< 1	< 20	1.0	4.1	< 2	< 5	< 200	< 500
PI 76	< 5	< 1	< 5	240	< 1	< 10	24	28	200	3	< 2	4.5	< 2	< 100	11	< 0.5	< 2	2.40	45	33	< 0.2	17.0	< 10	3.6	< 200	< 1	< 1	< 20	1.3	1.4	< 2	< 5	< 200	< 500

APPENDIX D

DATA FOR INDIVIDUAL MINES AND PROSPECTS IN THE PINALENO-GREASEWOOD
MOUNTAINS UNIT, CORONADO NATIONAL FOREST, GRAHAM COUNTY, ARIZONA

Mine Name or Mineralized Area

Unnamed adit

Location

About 1 mi NE. of Lindsey Canyon.
NE. 1/4 sec. 17, T. 8 S., R. 22 E.

Production

Small, if any.

Development

Adit, approximately 250 ft long.

Current Status

Inactive.

Miscellaneous

Sample PI 1, plate 1.
About 750 st of dump.
Loose, dangerous rock in adit.

Geologic Description and Ore Mineralogy

Aphanitic, dark gray dike, about 3 ft thick with intermixed quartz stringers and veins up to 2 ft thick, strike N. 50° E., dip 70° SE.; pyrite and oxidized pyrite in quartz. Country rock medium-coarse grained granite.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Near Lindsey Canyon.
SW. 1/4 sec. 16, T. 8 S., R. 22 E.

Production

Likely none.

Development

Pit 20 ft diameter, 4 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 2, fig. 2.
Less than 100 st of dump.

Geologic Description and Ore Mineralogy

Quartz vein in granite, strike N. 35° E., vertical dip; minor disseminated pyrite, hematite and manganese stains.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Near Lindsey Canyon
SW. 1/4 sec. 36, T. 17 S., R. 31 E.

Production

Small, if any.

Development

Pit 25 x 12 x 8 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 3, fig. 2.
Less than 200 st of dump.

Geologic Description and Ore Mineralogy

Quartz vein material, not exposed in place; azurite, galena, malachite, minor chalcopyrite, oxidized sulfides.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Lindsey Canyon.
SE. 1/4 sec. 16, T. 8 S., R. 22 E.

Production

Likely none.

Development

Prospect pit 15 x 12 x 3 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 4, fig. 2.
Small dump.

Geologic Description and Ore Mineralogy

Quartz vein 2 to 2 1/2 ft thick, strike N. 40° E., near vertical dip; crops out intermittently on surface for about 100 ft; blebs of galena, pyrite, oxidized pyrite; granitic country rock.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Lindsey Canyon.
SE. 1/4 sec. 16, T. 8 S., R. 22 E.

Production

Likely none.

Development

Pit 15 x 12 x 6 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 5, fig. 2.
Small dump.

Geologic Description and Ore Mineralogy

Quartz vein 4 ft thick in granitic country rock, strike N. 85° W., dip 88° N.; crops out on surface intermittently for 400 ft; sparse disseminated pyrite, galena, malachite.

References

None.

Mine Name or Mineralized Area

Prospect pit, near President Mine.

Location

About 1/2 mi SE. of Lindsey Canyon.
NW. 1/4 sec. 22, T. 8 S., R. 22 E.

Production

Likely none.

Development

Pit 15 ft diameter, 8 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 6, fig. 2.
Small dump.

Geologic Description and Ore Mineralogy

Quartz vein 2 ft thick, strike N. 45° E., vertical dip, in granitic rock, minor pyrite in quartz.

References

None.

Mine Name or Mineralized Area

President Mine.

Location

About 1/2 mi SE. of Lindsey Canyon.
NW. 1/4 sec. 22, T. 8 S., R. 22 E.

Production

Likely small gold and silver.

Development

Shaft, about 11 x 8 ft collar, 32 ft down to water; size of dump indicates 100 to 200 ft of workings.

Current Status

Inactive.

Miscellaneous

Samples Pl 7, 8; fig. 2.
Approximately 500 st of dump.

Geologic Description and Ore Mineralogy

Quartz vein, 5 to 6 ft thick, strike N. 85° E., vertical dip; adjacent to 1 to 2 ft of sheared granite; some quartz contains disseminated pyrite and pyrite stringers; outcropping rock medium to coarse grained granite. On dump is an aphanitic, bluish-gray rock, may be a dike.

References

None.

Mine Name or Mineralized Area

Unnamed adit prospect

Location

Near the head of Bellows Canyon, northeast of Lindsey Canyon.
SE. 1/4 sec. 10, T. 8 S., R. 22 E.

Production

None.

Development

80 ft adit.

Current Status

Inactive.

Miscellaneous

Samples PI 9-13, fig. 3.
About 200 st dump.

Geologic Description and Ore Mineralogy

Highly fractured quartz vein in altered granitic rock, general strike N. 70° E., dip 60 NW.; numerous faults and shears with altered granitic rock and gouge, common limonite stains.

References

None.

Mine Name or Mineralized Area

Black Beauty prospect

Location

Between Van Valer Canyon and Durkee Canyon.
SW. 1/4 sec. 36, T. 8 S., R. 22 E.

Production

12 st units of WO_3 from 4 1/2 st of ore in 1955.

Development

Open cut about 50 x 15 x 15 ft deep; eroded trench about 150 ft long; 3 small prospect pits.

Current Status

Inactive.

Miscellaneous

Samples PI 14-20, fig. 4, PI 16-20 from quartz outcrops.
About 500 st of dump.

Geologic Description and Ore Mineralogy

Quartz vein in Precambrian schist, sparse disseminated scheelite in the schist, near contact with Precambrian granite.

References

Dale, 1959, p. 65-67.

Mine Name or Mineralized Area

Unnamed pit

Location

Near Gold Gulch, 1 1/2 mi E. of Fort Grant.
NW. 1/4 sec 29, T. 9 S., R. 24 E.

Production

None

Development

Pit, 12 x 6 x 4 ft deep.

Current Status

Inactive

Miscellaneous

Sample PI 21, fig. 5.
Small dump.

Geologic Description and Ore Mineralogy

Prominent footwall fault plane in granite and altered granite, strike N. 45° E., dip 70 SE.; limonite and manganese stains, minor pyrite and pyrite pseudomorphs.

References

None.

Mine Name or Mineralized Area

Unnamed open cut

Location

In Gold Gulch, 1 2/3 mi E. of Fort Grant.
SW. 1/4 sec. 29, T. 9 S., R. 24 E.

Production

None.

Development

Open cut, 10 ft wide.

Current Status

Inactive.

Miscellaneous

Sample PI 22, fig. 5.

Geologic Description and Ore Mineralogy

Dike, strike N. 50° W., vertical dip, aphanitic, tan, weathered; minor limonite and manganese stains; country rock weathered Precambrian granite.

References

None.

Mine Name or Mineralized Area

Unnamed pits

Location

Near Gold Gulch, 1 2/3 mi east of Fort Grant.
N. 1/2 sec 29, T. 9 S., R. 24 E.

Production

Likely none.

Development

Seven pits, largest one is 10 x 20 x 10 ft deep.

Current Status

Inactive.

Miscellaneous

Samples PI 23-25, fig. 5
Small dumps.

Geologic Description and Ore Mineralogy

Prominent shear zone, strike N. 45° E.-N. 55° E., dip 75° NW.-near vertical;
altered and sheared granite, disseminated pyrite, some oxidation.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Near Gold Gulch, 2 mi east of Fort Grant.
NE. 1/4 sec 29 or SE 1/4 sec. 20, T. 9 S., R. 24 E.

Production

None.

Development

Pit, 7 x 8 x 10 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 26, fig. 5.
Small dump.

Geologic Description and Ore Mineralogy

Prominent fault in altered and highly fractured granite, quartz lens 4 in. thick.

References

None.

Mine Name or Mineralized Area

Unnamed adit

Location

Near Gold Gulch, about 2 mi east of Fort Grant.
NE. 1/4 sec. 29 or SE 1/4 sec. 20, T. 9 S., R. 24 E.

Production

Likely none.

Development

Adit, approximately 75 ft long.

Current Status

Inactive.

Miscellaneous

Samples PI 27, 28, fig. 6.
Small dump.
Numerous bats in back half of adit.

Geologic Description and Ore Mineralogy

Altered and limonite-stained granite, two prominent fault zones.

References

None.

Mine Name or Mineralized Area

Unnamed adit, pit

Location

Near Gold Gulch, about 2 mi east of Fort Grant.
NE. 1/4 sec. 29 or SE 1/4 sec. 20, T. 9 S., R. 24 E.

Production

Small, if any.

Development

Adit, at least 95 ft of workings; small prospect pit.

Current Status

Inactive.

Miscellaneous

Samples PI 29-32, fig. 7.
Small dump.

Geologic Description and Ore Mineralogy

Major fault, altered granite, gouge, silicified rock, limonite stains, 2 quartz veins up to 10 in. thick, strike N. 35° E., steep southeast dip; country rock Precambrian granite.

References

None.

Mine Name or Mineralized Area

Unnamed adit

Location

Near Gold Gulch, about 2 mi east of Fort Grant.
NE. 1/4 sec. 29 or SE 1/4 sec. 20, T. 9 S., R. 24 E.

Production

None.

Development

90-ft-long adit.

Current Status

Inactive.

Miscellaneous

Samples PI 33-36, fig. 8.
small dump.

Geologic Description and Ore Mineralogy

Prominent fault zone, strike E-W, dip 60°-85° N.; altered, fractured granite.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Near Gold Gulch, about 2 mi east of Fort Grant.
NE. 1/4 sec 29 or SE. 1/4 sec. 20, T. 9 S., R. 24 E.

Production

None.

Development

Pit, 10 ft diameter, 10 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 37, fig. 5.
Small dump.

Geologic Description and Ore Mineralogy

Wide shear zone in white quartzite, strike N. 75° E., vertical dip; disseminated pyrite pseudomorphs.

References

None.

Mine Name or Mineralized Area

Unnamed shaft

Location

Near Gold Gulch, about 2 mi E. of Fort Grant.
SE. 1/4 sec. 20, T. 9 S., R. 24 E.

Production

None.

Development

Irregular shaft 15 x 8 x 20 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 38, fig. 5.
Small dump.

Geologic Description and Ore Mineralogy

Prominent shear zone, 2 to 2 1/2 ft thick, in white quartzite, strike N. 25° E., dip 75° E.; disseminated pyrite pseudomorphs.

References

None.

Mine Name or Mineralized Area

Unnamed shaft

Location

Near Mothers Canyon.
NE. 1/4 sec. 3, T. 10 S., R. 24 E.

Production

None.

Development

Shaft 10 ft diameter, 11 ft deep.

Current Status

Inactive.

Miscellaneous

Samples PI 39, 40; plate 1.
Small dump.
Shaft filled with water.

Geologic Description and Ore Mineralogy

Mafic dike in Precambrian granite, granite altered near contact; disseminated chalcopryite in granite, mostly in quartz veinlets; abundant malachite stains.

References

None.

Mine Name or Mineralized Area

White Rock uranium prospect

Location

Near Cove Canyon.
SE. 1/4 sec. 20, T. 10 S., R. 25 E.

Production

None.

Development

Pit, 10 x 12 x 3 ft deep, sloughed in.

Current Status

Inactive.

Miscellaneous

Sample PI 41, plate 1.
Small dump.

Geologic Description and Ore Mineralogy

Precambrian granite, limonite stains, adjacent to big quartz outcrop; scintillometer reading about twice background of 80 cps.

References

Unpublished field engineers report on file with Arizona Department of Mineral Resources.

Mine Name or Mineralized Area

Stony Peak uranium prospect

Location

Near Cove Canyon.
SW. 1/4 sec. 21, T. 10 S., R. 25 E.

Production

None.

Development

Open cut, about 25 x 24 x 16 ft deep at face.

Current Status

Inactive.

Miscellaneous

Samples PI 42-43, plate 1.
About 300 st dump.

Geologic Description and Ore Mineralogy

Precambrian granite, shear zone up to 1 ft thick, strike N. 78° W., vertical dip;
scintillometer reading up to six times background of 160 cps.

References

Unpublished field engineers report on file with Arizona Department of Mineral Resources.

Mine Name or Mineralized Area

Unnamed shaft.

Location

Near O-Bar-O Canyon.
NE. 1/4 sec. 18, T. 11 S., R. 25 E.

Production

Small, if any.

Development

Shaft, about 6 ft diameter, 15 ft deep.

Current Status

Inactive.

Miscellaneous

Samples PI 45, 46; plate 1.

Geologic Description and Ore Mineralogy

Shear zone, at least 5 ft thick, at contact between fine-grained dacite and dacite porphyry, strike N. 60° E., dip 86° SE.; turquoise seam 3/8 in. thick, sparse malachite stains.

References

None.

Mine Name or Mineralized Area

Unnamed shaft

Location

Near Gillman Canyon.
SW. 1/4 sec. 20, T. 11 S., R. 25 E.

Production

Small, if any.

Development

Shaft, 15 x 8 ft at collar, 31 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 47, plate 1.
About 300 st dump.

Geologic Description and Ore Mineralogy

Fracture zone in maroon andesite porphyry, strike N. 75° W., vertical dip;
chrysocolla in fractures.

References

None.

Mine Name or Mineralized Area

Unnamed trench

Location

South of Willow Springs Canyon.
SE. 1/4 sec. 13, T. 11 S., R. 25 E.

Production

None.

Development

Trench, 40 x 20 x 8 ft deep at deepest part.

Current Status

Inactive.

Miscellaneous

Sample PI 48, fig. 9.
About 250 st of dump.

Geologic Description and Ore Mineralogy

Contact between aphanitic, crumbly, chocolate-colored rock and amorphous, aphanitic, bluish-purple-dark gray rock, likely an altered and weathered dike, strike N. 70° E., dip 65° S.; granite country rock about 70 ft from both sides of trench.

References

None.

Mine Name or Mineralized Area

Unnamed shaft

Location

South of Willow Springs Canyon.
SE. 1/4 sec. 13, T. 11 S., R. 25 E.

Production

None.

Development

Shaft, 28 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 49, fig. 9.
Small dump.
Water in shaft, 6 ft below collar.

Geologic Description and Ore Mineralogy

Dark gray to black mafic dike rock, granite country rock.

References

None.

Mine Name or Mineralized Area

Unnamed decline

Location

South of Willow Springs Canyon.
SE. 1/4 sec. 13, T. 11 S., R. 25 E.

Production

Small, if any.

Development

Decline, irregular-shaped, about 30 ft long.

Current Status

Inactive.

Miscellaneous

Samples PI 50, 51; fig. 9.
About 200 st dump.

Geologic Description and Ore Mineralogy

Contact, hanging wall is aphanitic, crumbly, chocolate-colored rock; footwall is aphanitic, bluish-purple-dark gray rock, likely altered and weathered dike; strike N. 55° W., dip 45° SW. Small stockpile on dump contains altered rock, limonitic gossan, galena, sphalerite, and smithsonite.

References

None.

Mine Name or Mineralized Area

Unnamed decline

Location

South of Willow Springs Canyon.
SW. 1/4 sec. 18, T. 11 S., R. 26 E.

Production

None.

Development

Decline, approximately 50 ft long.

Current Status

Inactive.

Miscellaneous

Sample PI 52.
About 150 st dump.

Geologic Description and Ore Mineralogy

Sheared dike and quartz stringers, granite country rock.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

South of Willow Springs Canyon.
SW. 1/4 sec. 18, or NW 1/4 sec. 19, T. 11 S., R. 26 E.

Production

None.

Development

Pit, 20 x 15 x 8 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 53, fig. 9.
About 100 st dump.

Geologic Description and Ore Mineralogy

Mafic dike and altered granite.

References

None.

Mine Name or Mineralized Area

Unnamed bulldozer cut

Location

Near head of Willow Springs Canyon.
SW. 1/4 sec. 13, T. 11 S., R. 25 E.

Production

None.

Development

Bulldozer cut, mostly sloughed in.

Current Status

Inactive.

Miscellaneous

Sample PI 54, plate 1.

Geologic Description and Ore Mineralogy

Volcanic rock, probably andesite, minor chrysocolla.

References

None.

Mine Name or Mineralized Area

Unnamed pit

Location

Near head of Willow Springs Canyon.
SW. 1/4 sec. 13, T. 11 S., R. 25 E.

Production

None.

Development

Small pit.

Current Status

Inactive.

Miscellaneous

Sample PI 55, plate 1.

Geologic Description and Ore Mineralogy

Shear zone in volcanic breccia, strike N.-S., vertical dip; clayey gouge; altered, weathered rock; abundant limonite.

References

None.

Mine Name or Mineralized Area

Unnamed shaft

Location

Little Cottonwood Canyon.
SW. 1/4 sec. 2, T. 11 S., R. 25 E.

Production

None.

Development

Shaft, 34 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 56, plate 1.
About 100 st dump.

Geologic Description and Ore Mineralogy

Volcanic alluvium material, minor chrysocolla on dump.

References

None.

Mine Name or Mineralized Area

Unnamed adit

Location

Righthand Canyon

SW. 1/4 sec. 2 or NW. 1/4 sec. 11, T. 10 S., R. 25 E.

Production

Small, if any.

Development

Adit, 100 ft long, stope to surface; trench, 40 ft long, 10 ft deep.

Current Status

Inactive

Miscellaneous

Samples PI 57-60, fig. 10.

Geologic Description and Ore Mineralogy

Prominent fault in Precambrian granite; strike N. 38° E., vertical dip; fractured, altered granite, clayey gouge, quartz stringers and fragments, pyrite and galena.

References

None.

Mine Name or Mineralized Area

Unnamed trench

Location

North of Spring Canyon.
SE. 1/4 sec. 13, T. 9 S., R. 25 E.

Production

Small, if any.

Development

Trench, about 100 ft long, 15 ft deep at deepest.

Current Status

Inactive.

Miscellaneous

Samples PI 61, 62; plate 1.

Geologic Description and Ore Mineralogy

Major fault zone, up to 10 ft thick, strike N. 35° W., near vertical dip; shattered and sheared gneiss, clayey gouge, chrysocolla, hematite, limonite; country rock Precambrian granitic gneiss.

References

None.

Mine Name or Mineralized Area

Unnamed cut

Location

Near Lefthand Canyon.
NW. 1/4 sec. 12, T. 9 S., R. 25 E.

Production

None.

Development

Small cut.

Current Status

Inactive.

Miscellaneous

Sample PI 63, plate 1.

Geologic Description and Ore Mineralogy

Zone of altered, Precambrian gneiss adjacent to big outcrop of bull quartz; gneiss is shattered and limonite stained, big crystals of hornblende up to 3 in. across.

References

None.

Mine Name or Mineralized Area

Unnamed prospect

Location

Marijilda Canyon
NE. 1/4 sec. 33, T. 8 S., R. 25 E.

Production

None.

Development

10-ft-long tunnel, connects with pit 15 x 7 x 6 ft deep.

Current Status

Inactive.

Miscellaneous

Sample PI 64, 65; plate 1.

Geologic Description and Ore Mineralogy

Shear zone, strike N.-S., dip 25° E., sheared gneiss, clayey gouge, adjacent to silicified zone with abundant disseminated pyrite; country rock Precambrian granitic and biotite gneiss.

References

None.

Mine Name or Mineralized Area

Unnamed adit

Location

Between Ash Creek and White streaks Canyon.
SW. 1/4 sec. 35, T. 7 S., R. 24 E.

Production

None.

Development

Adit, 255 ft long.

Current Status

Inactive.

Miscellaneous

Samples PI 66-75, fig. 11.
About 600 st dump.

Geologic Description and Ore Mineralogy

Precambrian mafic, granitic schist, minor structure, quartz-aplite stringers and veins, minor malachite and limonite stains.

References

None.

Mine Name or Mineralized Area

Unnamed adit

Location

Between Ash Creek and White Streaks Canyon.
NW. 1/4 sec. 35, T. 7 S., R. 24 E.

Production

None.

Development

Adit, 23 ft long.

Current Status

Inactive.

Miscellaneous

Sample PI 76, plate 1.
Small dump.

Geologic Description and Ore Mineralogy

Precambrian mafic, granitic gneiss, minor structure, no ore minerals identified.

References

None.

APPENDIX E

MINE LOCATION AND MINE MAP FIGURES FOR THE
PINALENO-GREASEWOOD MOUNTAINS UNIT, CORONADO
NATIONAL FOREST, GRAHAM COUNTY, ARIZONA

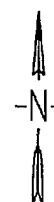
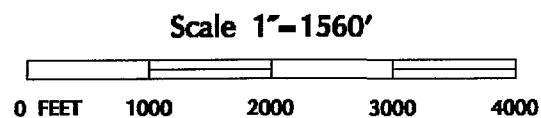
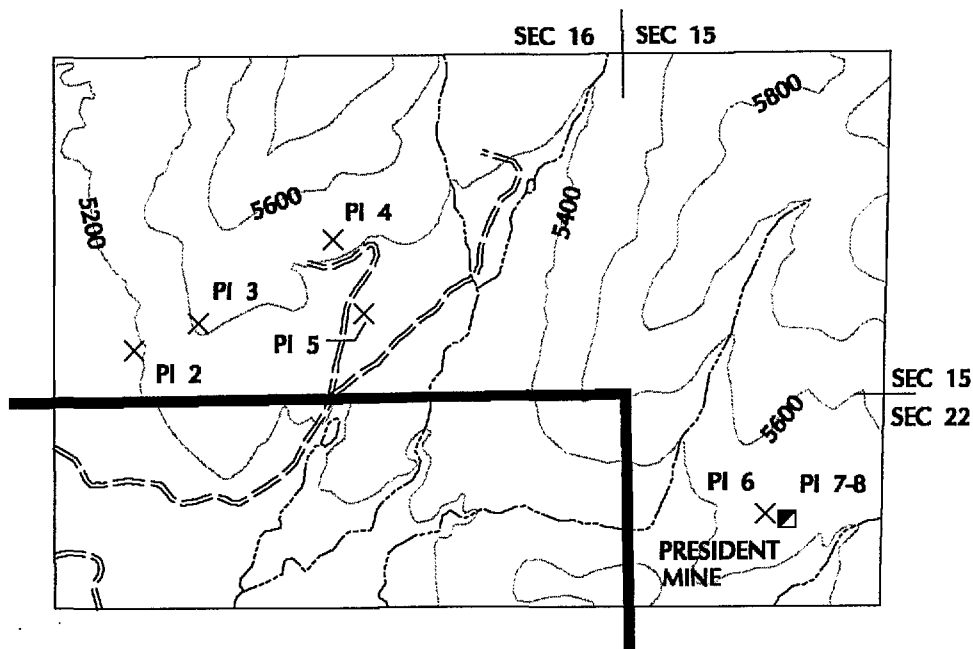


Figure 2.— Mines and prospects in the Lindsey Canyon area showing sample localities PI 2-8.

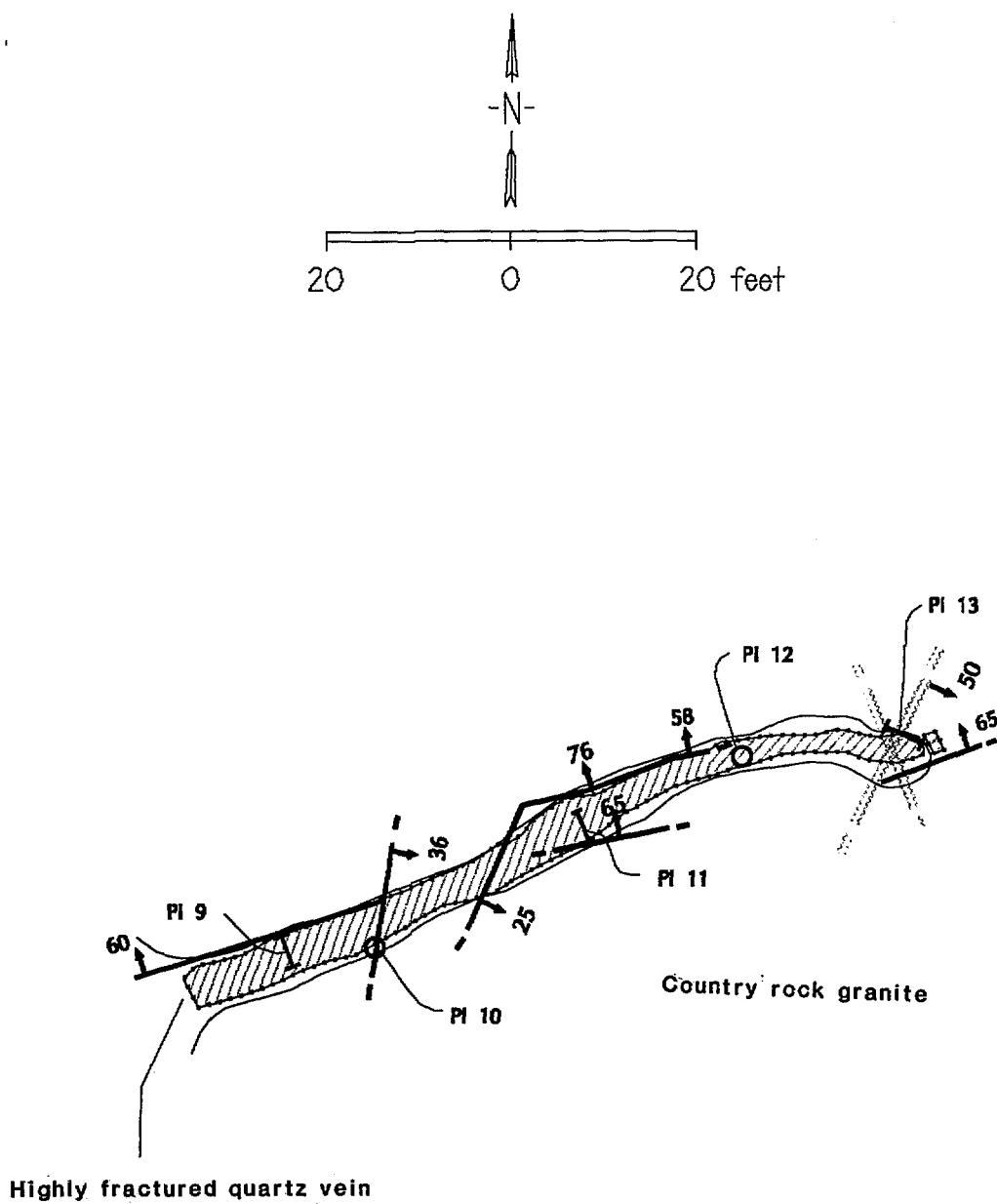


Figure 3.—Adit near Bellows Canyon, head of Tripp Canyon,
showing sample localities PI 9-13.

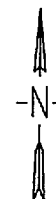
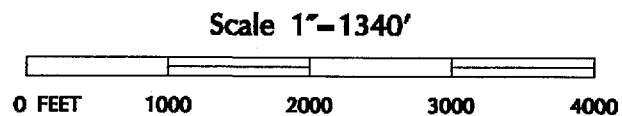
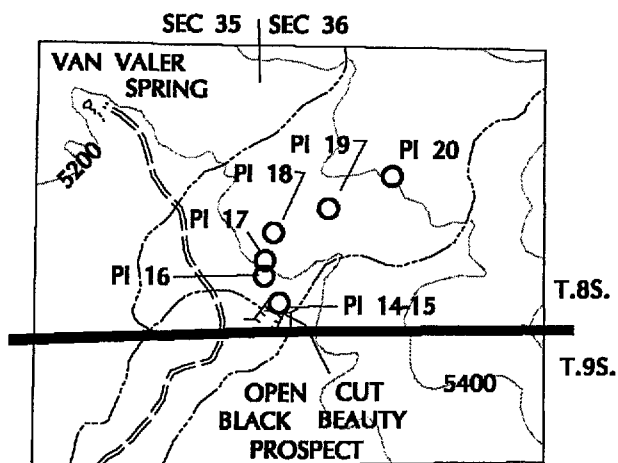


Figure 4.— Black Beauty prospect showing sample localities
PI 14-20.

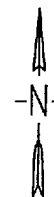
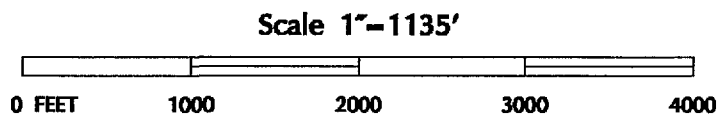
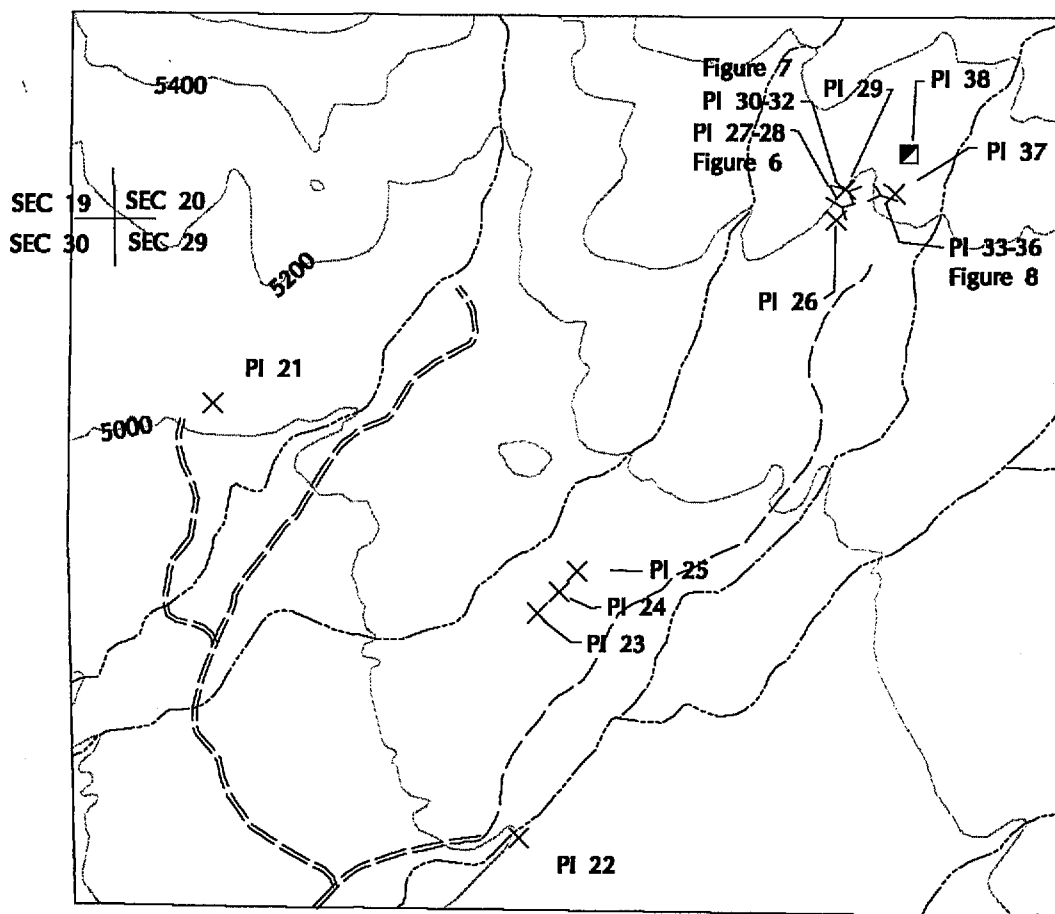


Figure 5.—Mines and prospects near Gold Gulch showing sample localities PI 21-38.

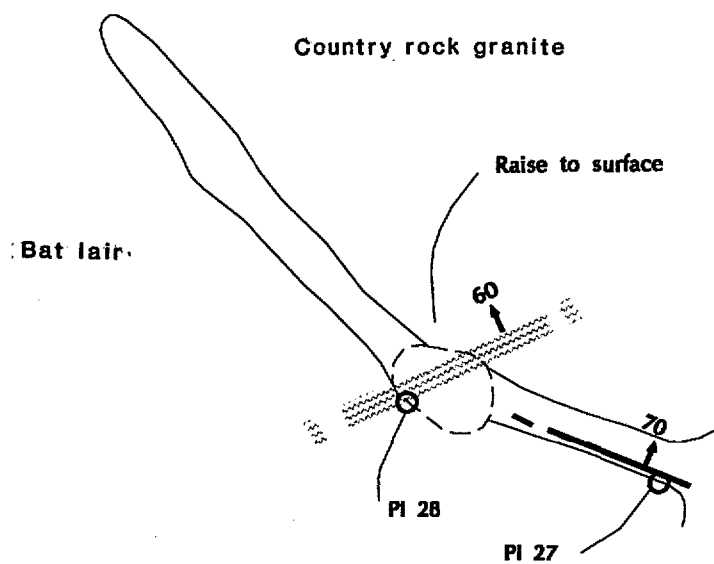
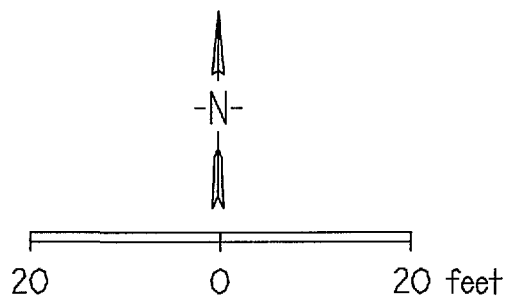


Figure 6.—Adit near Gold Gulch showing sample localities
PI 27-28.

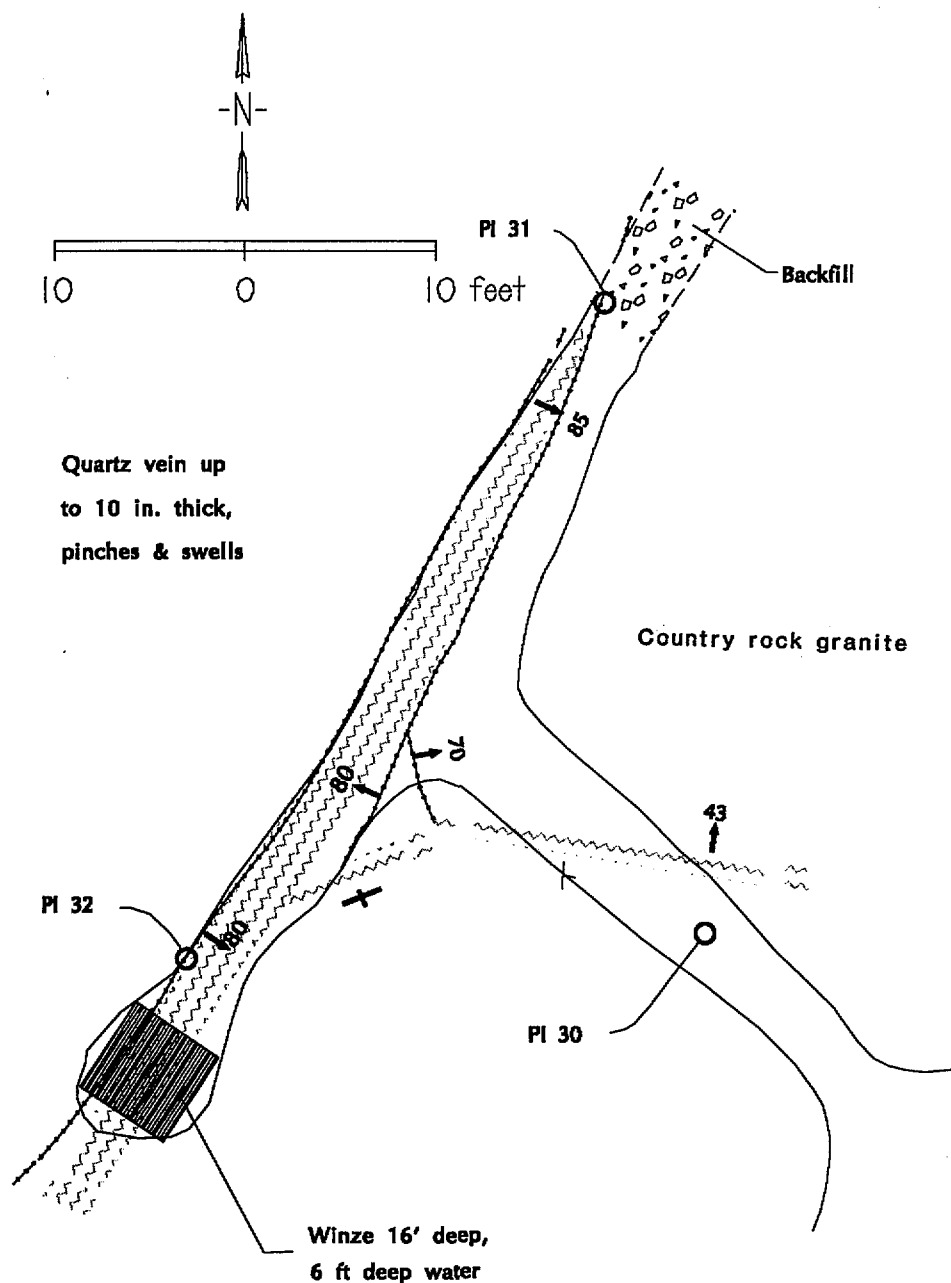


Figure 7.--Adit near Gold Gulch showing sample localities
PI 30-32.

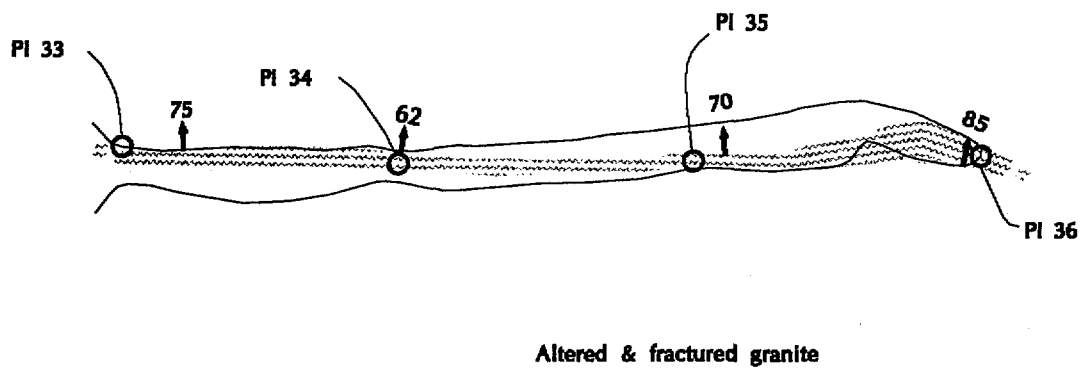
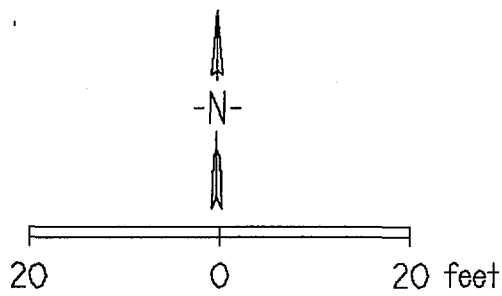


Figure 8.—Adit near Gold Gulch showing sample localities
PI 33-36.

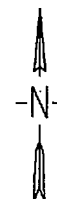
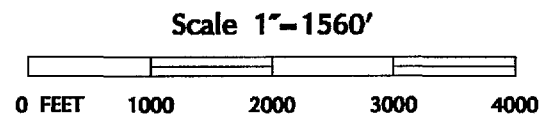
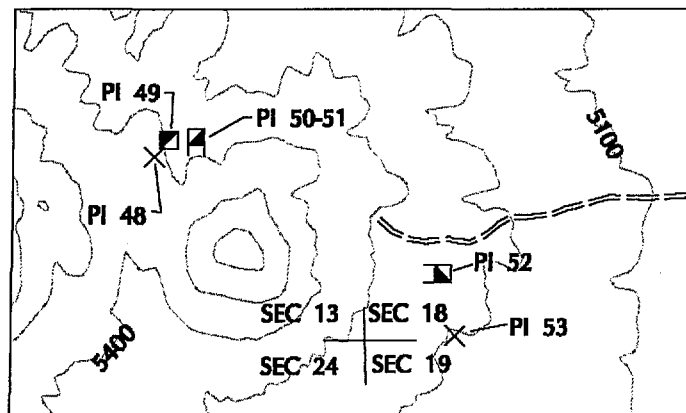


Figure 9.—Prospects near Willow Spring Canyon showing sample localities PI 48-53.

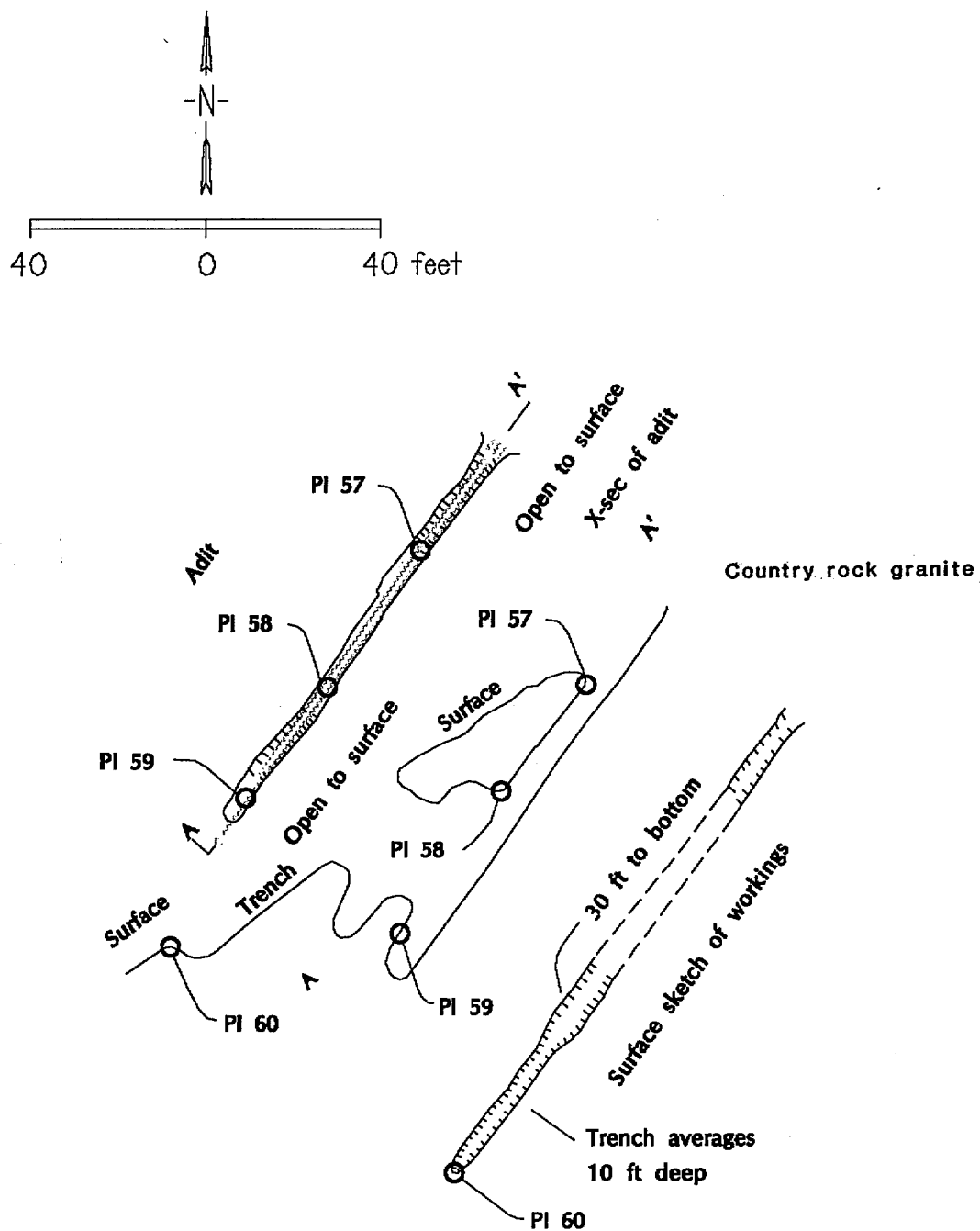


Figure 10.--Adit in Righthand Canyon showing sample localities PI 57-60.

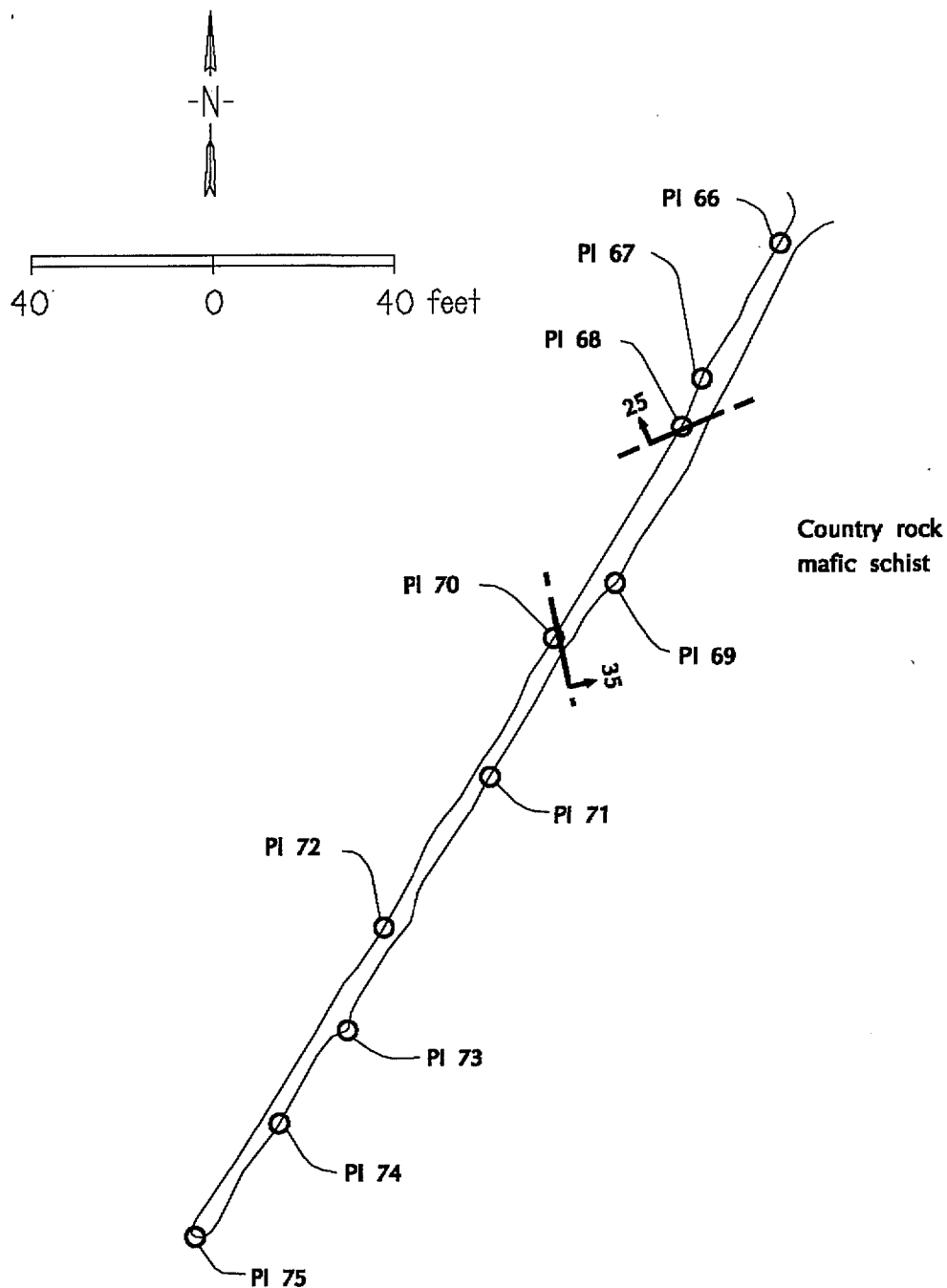
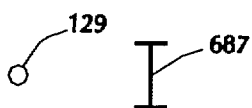


Figure 11.—Adit between Ash Creek and White Streaks Canyon showing sample localities PI 66-75.

EXPLANATION OF SYMBOLS FOR REPORT FIGURES, INCLUDING:

Features of detailed mine maps, both surface and underground,
at various scales (larger than 1:24,000).



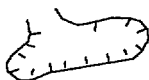
ROCK SAMPLE LOCALITY--Showing sample number



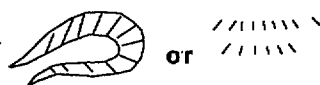
TRENCH



PITS



OPEN CUT



DUMPS

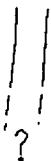


STOCKPILE



ADIT PORTAL (left);

ADIT PORTAL WITH TRENCH OR OPEN CUT (right)



LEVEL WORKING--Dashed and/or queried
where uncertain



INCLINED WORKING--Showing degree of inclination,
chevrons pointing down; queried where uncertain
or inaccessible



TIMBERED (Vertical timbers and/or lagging)



CAVED



RUBBLE (BACKFALL) FILLED, MUCK-FILLED, OR
BACKFILLED WORKING--Queried where uncertain
or inaccessible

EXPLANATION OF SYMBOLS FOR REPORT FIGURES, INCLUDING:

Features of detailed mine maps, both surface and underground,
at various scales (larger than 1:24,000)--Continued.



STEP DOWN IN SILL--Showing drop in feet;
hachures on down side



RAISE, head (left); RAISE, foot (right)



RAISE GOING UP AND WINZE GOING DOWN



WINZE--Noted if water filled



MANWAY (left); CHUTE (right)



SHAFT, open at surface (left);
SHAFT, bottom (right)



PILLAR

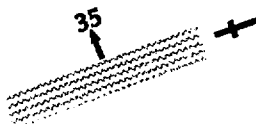
GEOLOGIC SYMBOLS



Strike and dip of bedding



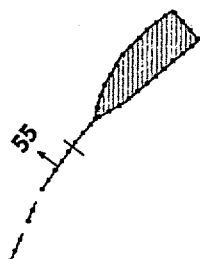
Fault--Showing strike and dip (inclined or
vertical, degrees); dashed where approximate



Fault zone or shear zone--Showing strike and
dip (inclined or vertical, degrees); dashed
where approximate



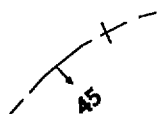
Thrust fault--Sawteeth on upthrown side



Vein--Showing strike and dip (inclined or
vertical, degrees); dashed where approximate

**EXPLANATION OF SYMBOLS FOR REPORT FIGURES, INCLUDING:
Features of detailed mine maps, both surface and underground,
at various scales (larger than 1:24,000)--Continued.**

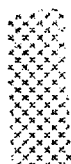
GEOLOGIC SYMBOLS--Continued



Contact--Showing strike and dip (inclined or vertical, degrees); dashed where approximate



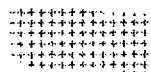
Dike--Showing strike and dip (inclined or vertical, degrees); dashed where approximate



Shattered zones



Brecciated zones



Igneous rock zone or structure



Mineralized zone, disseminated

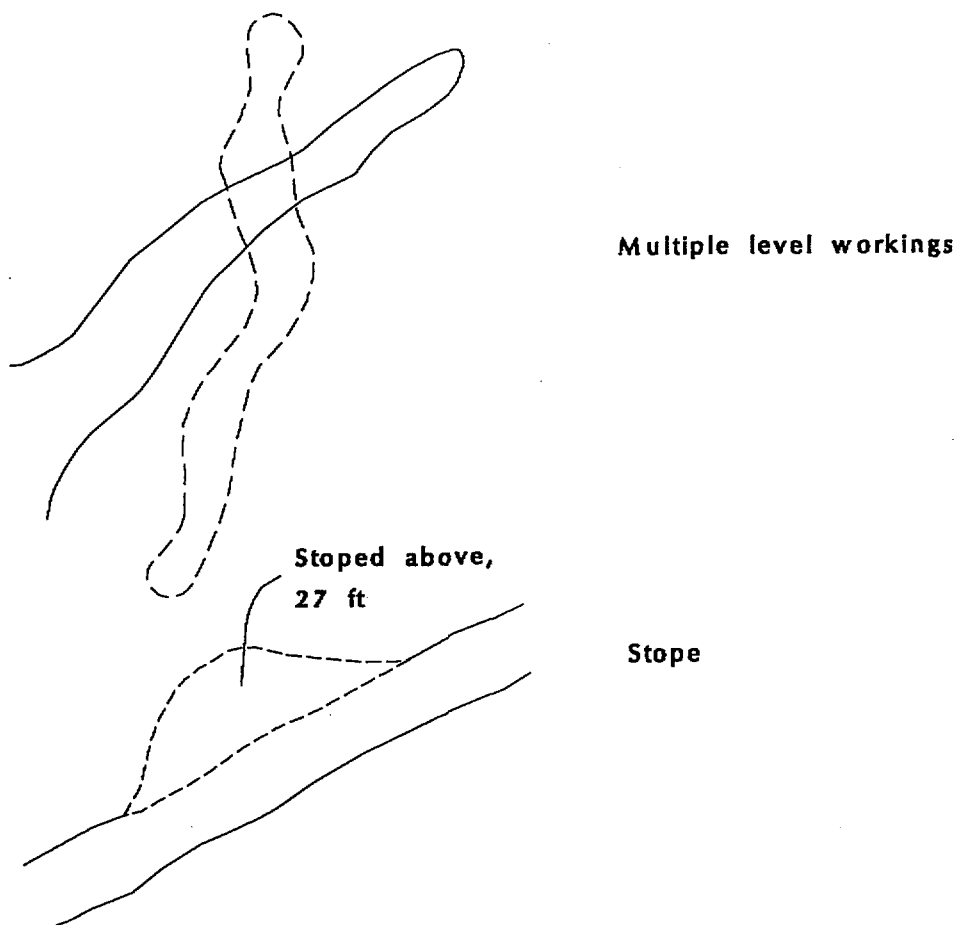


Mineralized zone, localized





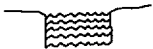


Zone containing resources











**EXPLANATION OF SYMBOLS FOR REPORT FIGURES, INCLUDING:
Features of detailed mine maps, both surface and underground,
at various scales (larger than 1:24,000)--Continued.**



Symbols for vertical cross-section maps

	Crosscut
	Drift into facing wall
	Drift into removed wall
	Drift into facing and removed wall
	Water-filled winze

**EXPLANATION OF SYMBOLS FOR REPORT FIGURES AND PLATES, INCLUDING:
Inset maps at various scales and 1:126,720-scale plates.**

	APPROXIMATE BOUNDARY OF THE FOREST MANAGEMENT AREA
	APPROXIMATE BOUNDARY OF WILDERNESS
	NATIONAL MONUMENT BOUNDARY
	TOPOGRAPHIC CONTOUR—Showing elevation in feet above sea level
	STATE LINE
	COUNTY LINE
	PRIMARY SECONDARY ROADS
	UNIMPROVED ROADS TRAILS
	INTERMITTENT STREAMS
	MINING CLAIM BOUNDARIES



GRID TICK MARK

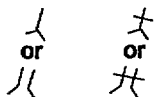


PATENTED MINING CLAIM

SURFACE OPENINGS—Showing sample number(s); symbols may represent more than one working. Also, VARIOUS REPRESENTATIONS OF SAMPLE SITES:



Rock sample locality—Showing sample number



Adit open (left); Adit, inaccessible (right)



Trenches




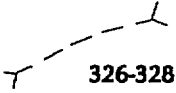







Open cut



Glory hole, open pit, or quarry

**EXPLANATION OF SYMBOLS FOR REPORT FIGURES AND PLATES, INCLUDING:
Inset maps at various scales and 1:126,720-scale plates—Continued.**

**SURFACE OPENINGS—Showing sample number(s);
symbols may represent more than one working. Also,
VARIOUS REPRESENTATIONS OF SAMPLE SITES—Continued:**

	Prospect (pit, open cut, or small trench)
	Tunnel
	Mine or quarry (active, left; inactive, right)
	Placer mine or gravel pit (active, left; inactive, right)
	Shaft, open to surface (left); Shaft, inclined (right)
	Shaft, water filled (left); Shaft, caved (right)
	Shaft, reclaimed
	Mine dump
	Drill hole collar